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JOURNAL OF
Agriculture
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Minister of Agriculture

Each lambing season brings its handful of orphan lambs for which no foster mothers can be found and our cover this month (from a colour photograph by L. F. Johnstone) shows a North Otago "black sheep" who has found an obviously acceptable substitute. Most flocks produce a few of these throwbacks to the original pigmented sheep. "Black sheep" has become a common appellation for the transgressor, though the black lamb's only failing is that by an accident of birth he has a type of wool which cannot be included with that sold from his orthodox mates. Black lambs usually suffer the early demise often glumly predicted for human black sheep.

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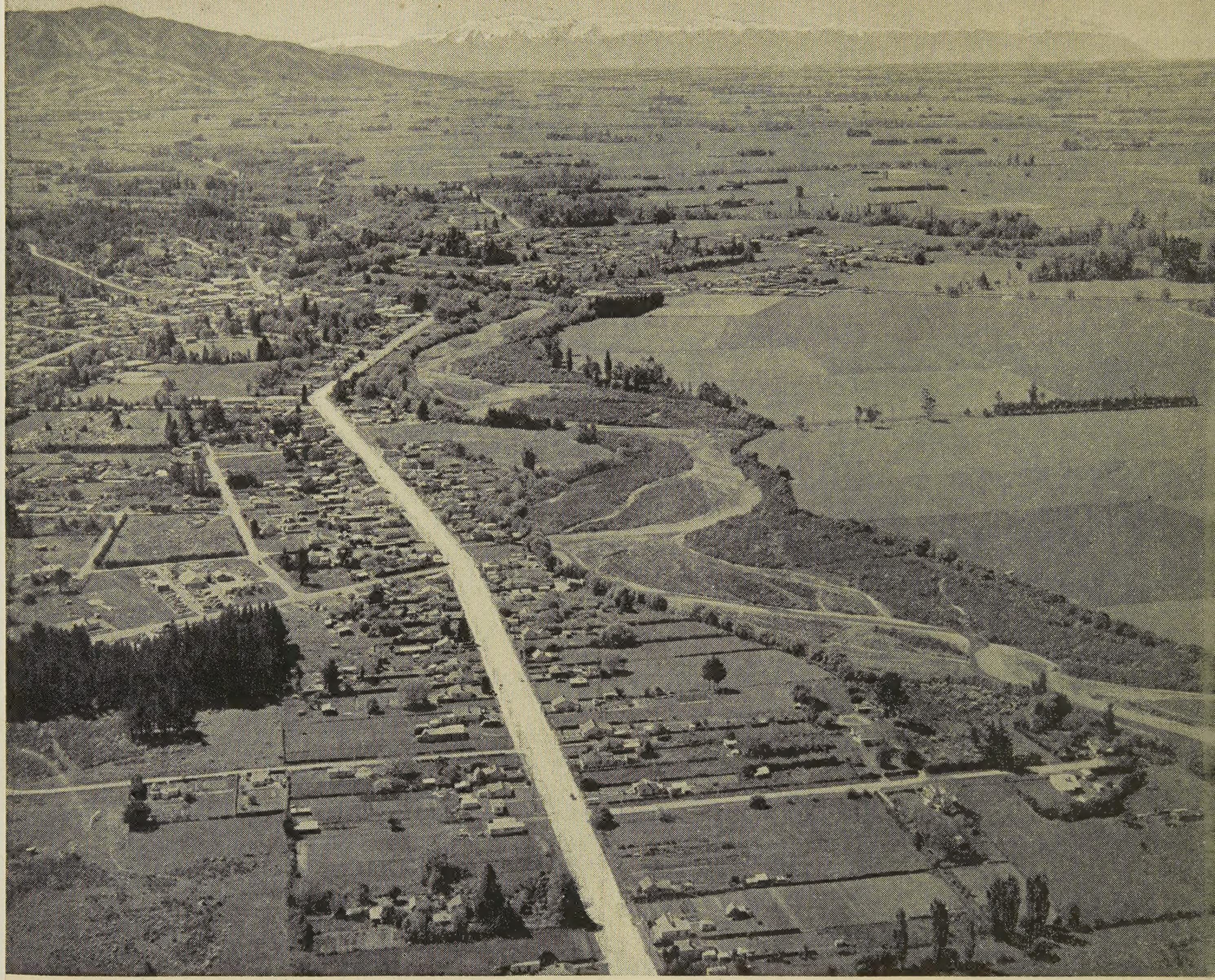


AFTER 100 YEARS' FARMING

PROPHETS AND SEERS, rather than historians, held the stage at the South Canterbury Centennial Farm Conference at Timaru in July. There was little dwelling on the achievements of the past, but much interest in authoritative opinions on the way out of current marketing difficulties, advisable alterations in the pattern of production, and probable developments in farming and markets. Highlight of the conference was the field day in the Orton district in which remarkable recent development of a light land property was seen and discussed and the potentials of the large area of this type of country in the district were indicated.

GENERAL impressions arising from papers and discussions were that the district, with perhaps as varied a pattern of agriculture as any other in New Zealand, is entering the second century of farming with all components of the farming industry in good heart. There are indications of great potential expansion, and provided farming incomes are sufficient in the immediate future to enable the capital expenditure necessary to implement new techniques of development and management, progress should be rapid, with cumulative benefits that should ensure an even more impressive balance sheet to be presented at the end of another century of farming.

THE **high country** particularly, with some unhappy interludes in the past, appears to be on the threshold of reaping many advantages from recent attention to some of its problems. New techniques of tussock land improvement appear to open great scope for expansion of use of the aeroplane in high country for surface

South Canterbury Centennial Farm Conference

—PEEPS INTO THE FUTURE

sowing of seed and fertiliser. There is a growing knowledge of the management requirements of summer and winter country, and increasing use of cattle in grazing control is enlarging the very narrow base on which the high country man's income has depended.

In the **foothills country** a new cycle of improvement has been offered with recent knowledge arising from trials with oversowing, fertilisers, and trace elements. Sulphur topdressing has given a new stimulus to pasture improvement and with management stepped up to make full use of the better grazing, production increases should be assured.

The **downs country** has steadily consolidated the improvements of recent years and a general pattern has been established for its management that should ensure its being able to produce the increased cereal crops required and at the same time carry more stock.

← The borough of Geraldine (pop. 1,640) lies between the Raukapuka Downs and the Waihi River on the inland fringe of the coastal plain. With dairy factory and stock saleyards it is the centre of an old established farming district. To the east are the plains and the light lands of the coast; to the west are the downs, the foothills, the high country, and the Southern Alps. White's Aviation photo.

On the **light land** of the coastal plains the use of lucerne offers spectacular opportunities for increased carrying capacity, and wider availability of irrigation water will enable more intensive use of land in these low-rainfall areas.

The conference was organised by the South Canterbury executive of Federated Farmers and the Timaru branch of the Department of Agriculture, the committee comprising Messrs G. J. Slater, chairman, D. R. Rowe, secretary, A. C. Begg, E. H. Bray, M. L. Cameron, and W. V. Hadfield. It is perhaps indicative of the progressiveness of the district's farming community that this centennial conference was held 6 months before the district's general celebrations of its first 100 years are due to begin. Opening speakers dwelt on the appropriateness of farmers leading the way in a district where agriculture has always been paramount.

Marketing Difficulties

In referring in his opening address to the increased production that was evident on every hand, and of which South Canterbury seemed to be able to show a fair share, the Minister of Agriculture, Mr Skinner, regretted that the same progress did not seem to have been made in marketing. "Governments throughout the world are taking a keener interest in marketing than ever before," he said, "and artificial stimulants given to production in many countries have injured our markets. We have to fight to stay in the swim at all."

Farming organisations on their own could not deal with the position, as they would be competing with Governments in other countries, and it was essential that negotiations should be on a Government-to-Government level.

"In finding a way out of our marketing difficulties it would ill behove us to do the same as other Governments have done and thus risk a charge of dumping against ourselves," warned Mr Skinner. "The moment we become dumpers on the United Kingdom market that protection we have been promised and have been receiving will be taken away."

The important part that could be played by South Canterbury in contributing to the added production of wheat and potatoes that would assist the balance of payments position was referred to by Mr Skinner; strong indications of increased wheat acreages in the coming season were a heartening response to the Government's decision to increase the price to growers.

Trends in N.Z. Production

Remarking that it was the first time he had ventured into the forecasting business, Mr P. W. Smallfield, Director-General of Agriculture, in presenting a review of agricultural production and likely trends in development, emphasised his faith that New Zealand's strength lay in the range of products she produced. They were permanent advantages that would surely prevail against the temporary expedients used to bolster uneconomic farming in more industrialised countries whose artificially stimulated farm exports were competing with our products on world markets. New Zealand had great ability to increase production economically and best prospects for the future lay in preparation to meet expanding demand for animal products while meeting present difficulties by slackening emphasis on dairy production, expanding beef production, and trying to supply all domestic needs for cereals and seeds.

Sound Rotation Vital

The responsibilities of the farming community to farm the land in the manner to which it is best suited and to maintain and increase its productivity were emphasised by Mr W. C. Stafford in a paper in which he endeavoured, "by looking at the past and slightly into the future", to indicate possibilities for progress in South Canterbury.

"Over the last few months there has been a lot of writing and talk that farming in New Zealand must become more diversified," he said. "This term 'diversified farming' as far as South Canterbury is concerned is loose, erroneous, and misleading. It means nothing, it gives no lead, and can do more harm in a year than can be rectified in ten. Haphazard methods of replacing crops with stock or vice versa without thought to a sound rotation will lead only to chaos and land depletion, evidence of which is in plenty in the history of the first 100 years of our province."

There was no doubt that with better management both crop acreage and stock numbers could be greatly increased, and it was in this direction that South Canterbury must progress, said Mr Stafford. "The land is in good heart, the knowledge and machinery both for cultivation and harvesting are already on the farms. It is not a question of decreasing stock and increasing crop; it is a need for increasing both. The increase of crop must not become suddenly disproportionate to pasture; otherwise the balance of stock to pasture will be upset. It does mean, however, that provision for more holding and fattening feed for stock will have to be made. In areas of moderate rainfall such as South Canterbury full use of pasture can never be made. It is only by ploughing pastures before their vigour has diminished, using the fertility that has been built by animal and pasture plant, by growing a crop, and resowing with full knowledge of pasture establishment that full production can be obtained."

The time had come when South Canterbury could greatly contribute to the Dominion's future and at the same time assist her own progress, and no province was better able to adapt itself and prosper. It was fortunate that the Department of Scientific and Industrial Research had persisted in the crossing and improving of strains of wheat. It was to the credit of those concerned that research and experiments had been carried on during so long a period of falling acreage against the day when the results might be needed.

FIELD DAY ON LIGHT LAND FARM

The 1,300-acre light land farm of Mr J. L. Barker, Orton, was visited on the field trip during the conference. On Lismore stony silt loam with a rainfall of 25 in., the property when bought in 1953 had no buildings and no improved pastures and was subdivided into only three small paddocks and three large blocks of 150, 250, and 700 acres. There was scattered gorse and matagouri on parts of the farm.

Setting himself an objective of 2 ewes and replacements per acre in 10 years, Mr Barker planned to plough each year the area he could manage to fence and to sow down about half of it in ryegrass and subterranean and white clover, about two-thirds of the rest in cocksfoot and subterranean and white clover, and the balance in turnips, eventually to go into lucerne.

Today, at the end of 4½ years, the state of development is:

	Acres
Ryegrass, subterranean and white clover	450
Cocksfoot, subterranean and white clover	162
Lucerne	120
Turnips and new grass ..	125
Rape stubble and short-rotation ryegrass or ploughed	87
Native	320
Ploughed out of native ..	35

From 640 ewes in 1954, stock carried has increased to 2,430, including 1,940 ewes and 440 ewe hoggets, or 1.8 sheep per acre.

Meat and wool production have been:

	1954-55	1955-56	1956-57	1957-58
Lamb meat per acre (lb.)	—	4.57	9.7	22.2
Wool per acre (lb.) ..	3.5	5.8	8.15	11.8
Wool per sheep (lb.) ..	7.1	6.6	7.9	8.4

The low wool weight per sheep in 1955-56 was the result of a very dry year and should be prevented in future with the availability of an increasing acreage of lucerne.

Mr Barker said he was confident that by the 8th year he would be exceeding 2 ewes per acre and replacements, which would give a total of something over 3,400 sheep (2,600 ewes, 750 hoggets). By then he hoped to be able to fatten all the surplus lambs and sheep, which was almost done this year, and the average wool weight would be between 8 and 9 lb., with a per acre production of 40 lb. of lamb meat and 20 lb. of wool.

Plans for handling the large acreage of lucerne were to provide an early lambing bite when necessary, making hay of all the surplus up until Christmas, and fattening lambs on it thereafter, taking hay as the opportunity and the season dictate. Under a dryland system of farming in Canterbury it was impossible to have too much lucerne.

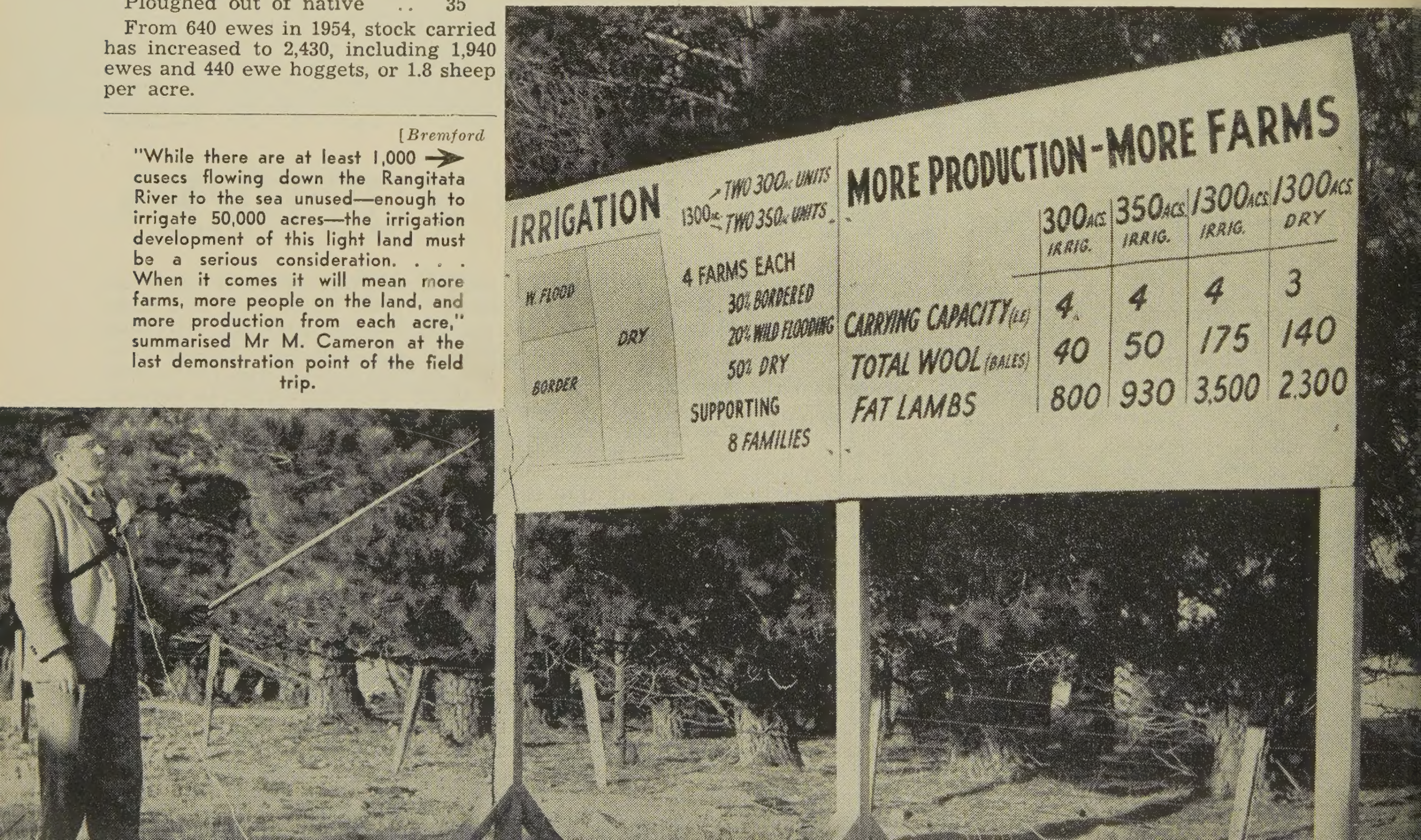
Grass had not been limed enough yet. It had a ton to the acre before drilling, and it had been hoped to put on a ton at least every 3 years. Grass was sown with 1 cwt. of superphosphate and got 1 cwt. the following spring and 1 cwt. yearly thereafter. DDT went on in the autumn of the year after sowing, but it was possibly not going on early enough in the rotation.

Each lucerne paddock had at least 2 tons of lime before seed was drilled, and after sowing it got ½ ton of lime and 1 cwt. of superphosphate in August and 1 cwt. after the first cut. In suitable years even more superphosphate could go on with benefit, but after November a dry year might make it a wasted effort.

"My general feeling about liming and topdressing at the moment," said Mr Barker, "is to give the lucerne every luxury and do the best you can for grasses and clovers."

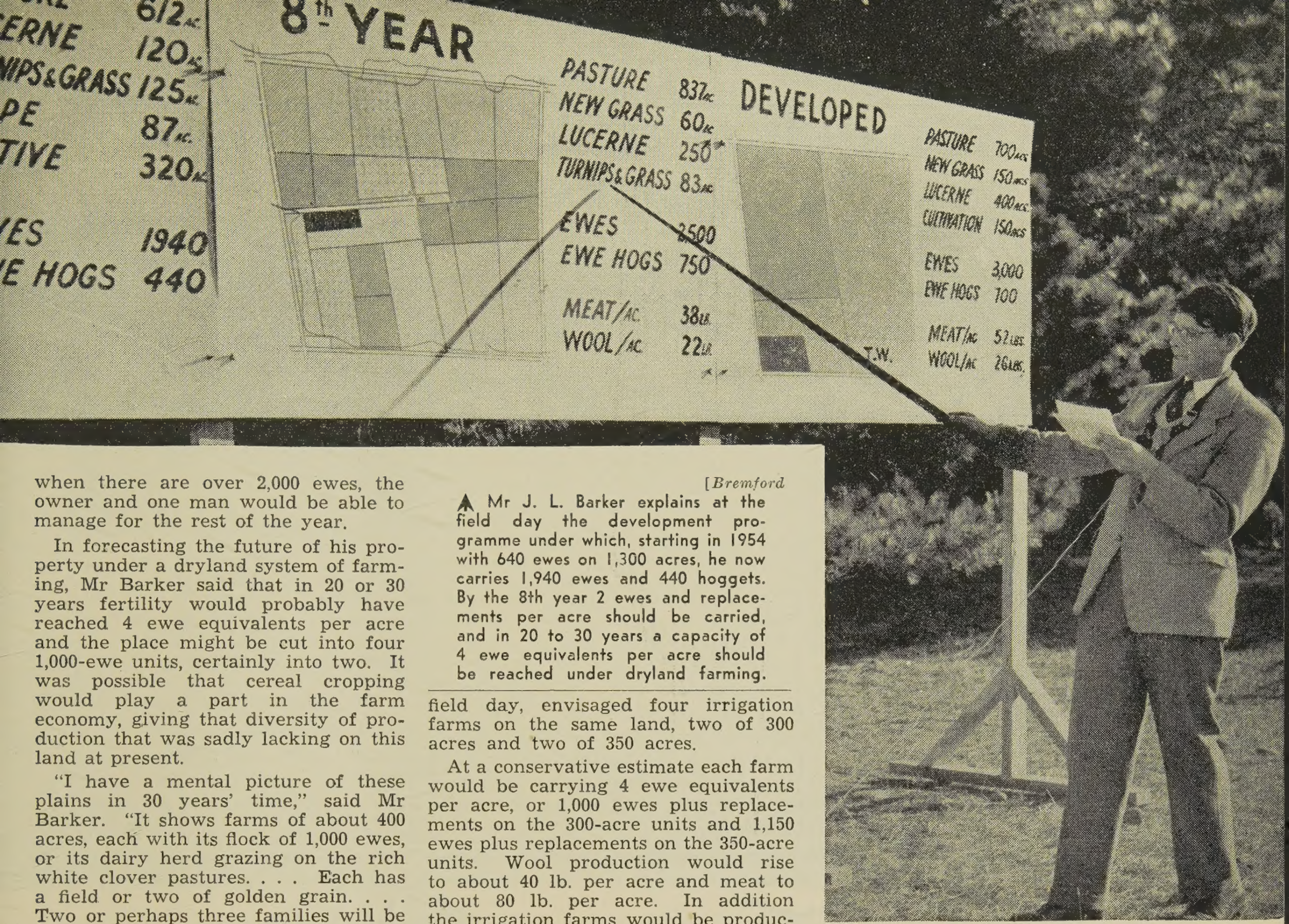
When the property was taken over there was a race at top and bottom of it. Wells for windmills had been put in here and there recently at an overall cost of £35 per well, each well watering stock on up to 200 acres.

Mr Barker has been running the farm with the help of one permanent single man, and he feels sure that apart from extra assistance at lambing



[*Bremford*

"While there are at least 1,000 ➔ cusecs flowing down the Rangitata River to the sea unused—enough to irrigate 50,000 acres—the irrigation development of this light land must be a serious consideration. . . . When it comes it will mean more farms, more people on the land, and more production from each acre," summarised Mr M. Cameron at the last demonstration point of the field trip.


6/2ac
ERNE 120ac
NIPS & GRASS 125ac
PE 87ac
TIVE 320ac
ES 1940
E HOGS 440
8th YEAR
PASTURE 837ac
NEW GRASS 60ac
LUCERNE 250ac
TURNIPS & GRASS 83ac
EWES 2500
EWE HOGS 750
MEAT/AC 38lb
WOOL/AC 22lb
DEVELOPED
PASTURE 700acs
NEW GRASS 150acs
LUCERNE 400acs
CULTIVATION 150acs
EWES 3,000
EWE HOGS 700
MEAT/AC 52lbs
WOOL/AC 26lbs
T.W.

[*Bremford*

▲ Mr J. L. Barker explains at the field day the development programme under which, starting in 1954 with 640 ewes on 1,300 acres, he now carries 1,940 ewes and 440 hoggets. By the 8th year 2 ewes and replacements per acre should be carried, and in 20 to 30 years a capacity of 4 ewe equivalents per acre should be reached under dryland farming.

when there are over 2,000 ewes, the owner and one man would be able to manage for the rest of the year.

In forecasting the future of his property under a dryland system of farming, Mr Barker said that in 20 or 30 years fertility would probably have reached 4 ewe equivalents per acre and the place might be cut into four 1,000-ewe units, certainly into two. It was possible that cereal cropping would play a part in the farm economy, giving that diversity of production that was sadly lacking on this land at present.

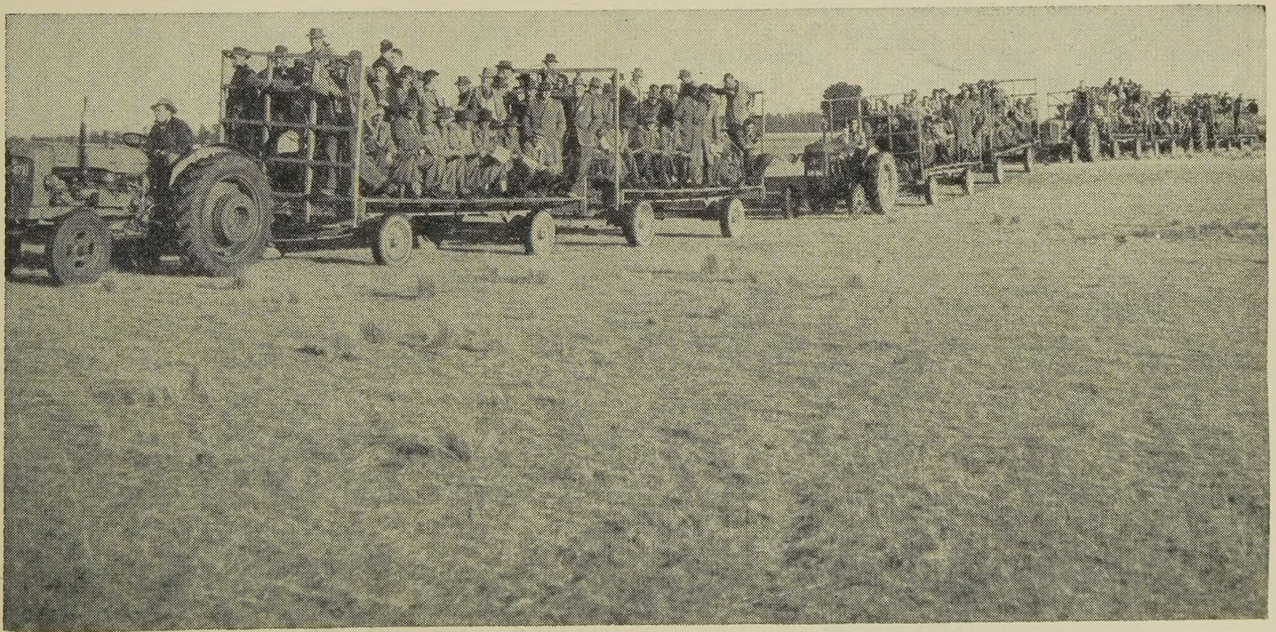
"I have a mental picture of these plains in 30 years' time," said Mr Barker. "It shows farms of about 400 acres, each with its flock of 1,000 ewes, or its dairy herd grazing on the rich white clover pastures. . . . Each has a field or two of golden grain. . . . Two or perhaps three families will be supported in reasonable affluence on each farm. . . ."

Looking into a future of irrigation farming that Mr Barker would not contemplate, Mr M. Cameron, Instructor in Agriculture, who organised the field day, envisaged four irrigation farms on the same land, two of 300 acres and two of 350 acres.

At a conservative estimate each farm would be carrying 4 ewe equivalents per acre, or 1,000 ewes plus replacements on the 300-acre units and 1,150 ewes plus replacements on the 350-acre units. Wool production would rise to about 40 lb. per acre and meat to about 80 lb. per acre. In addition the irrigation farms would be producing grass and clover seeds. With 50 per cent irrigation, production increases over the dryland system could conservatively be estimated at 25 per cent in wool and 50 per cent in lamb meat.

[*Bremford*

▼ Hay bale seating on flax trailers accommodated most of the crowd of about 500 on the field day for a quick and comprehensive tour round the Orton farm of Mr J. L. Barker.



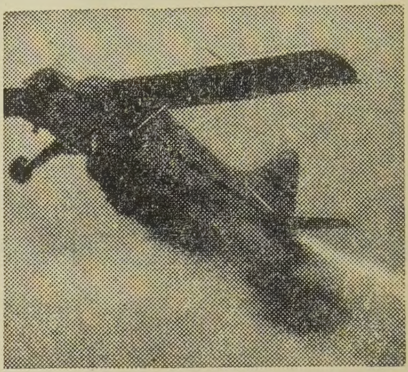
WIDESPREAD USE OF SHELL ALDRIN, DIELDRIN ACHIEVES CONTROL OF MAJOR INSECT PESTS. Recently developed insecticides now used as basis of many commercial formulations, including sheep-dips, dusts and insect sprays.

The development by the world-wide Shell research organisation, of the basic chemical insecticides aldrin, dieldrin and their derivatives, is undoubtedly one of the most important single events since the war in the field of agicultural chemicals.

In New Zealand, for example, most effective formulations for both sheep dips and dusting preparations are based on aldrin and dieldrin. These new products offer not only complete control of lice, keds and other parasites, but provide long-term protection against blowflies, as well.

The range of control given by aldrin and dieldrin among crop and pest insects includes a wide range of pests, such as armyworm, crickets, grass grub, beetles, weevils, etc. In general, where sub-soil protection is required, aldrin preparations are recommended due to their cheapness in use and powerful residual properties. Above-ground insects are more effectively controlled with dieldrin.

Dramatic confirmation of aldrin and dieldrin's value to the New Zealand farmer is provided by their use to control the plagues of crickets and armyworms which have periodically devastated certain areas of the North Island. Wireworms, thrips and many other chewing crop pests are particularly susceptible to aldrin and dieldrin formulations which are now available from suppliers throughout the Dominion.



One of the latest highly successful applications of aldrin and dieldrin is in use with fertilisers as a combined mix. The above photograph shows a North Auckland area infested with crickets being commercially sprayed with dieldrin/superphosphate mix.

ALDRIN and DIELDRIN are products of the SHELL AGRICULTURAL DIVISION. Aldrin and dieldrin are made only by Shell, world's largest supplier of agricultural chemicals.

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[*National Publicity*

Increasing production in the high country indicates that sheep population is now within the sustained grazing capacity of the country, and that progressive restoration of cover may be expected, according to Mr L. P. Chapman. From the lower tussock slopes of Glentanner Station in the Ben Ohau Range this view up the Tasman River to the glacier in the middle background shows Mt. Cook on the left and the Burnett Range on the right.

High Country Management

After reviewing the remarkable improvement in high country production in recent years and the factors—changes in management, a succession of good seasons, and control of rabbits—to which it is attributed, Mr L. P. Chapman said he would prefer to emphasise the importance of a new and constructive approach to management.

"Whatever the factors responsible," he said, "the important fact is that the lowest ebb in high country affairs has been passed and the tide of production is now on the increase. This is a sure indication that the sheep population is now within the sustained grazing capacity of the country and that a progressive restoration of cover may be expected. . . .

"Without minimising the wonderful work done in rabbit destruction, so ably led by Mr G. B. Baker of South Canterbury, I think that the rabbit invasion should be regarded as a passing phase. Like the Romans, they came and saw and conquered, but are now, at the price of unceasing vigilance, on the way out in most areas. On the other hand, the partnership of tussock country and stock in sustained production should always be with us.

"In districts where rabbits have previously been really bad there seems to be a tendency for farmers to rest on their oars and to be satisfied with the resultant recovery of the country. However, the few farmers who have taken the further step of active improvement by surface sowing of seed and, where necessary, fertiliser have provided a striking example of what may be achieved. The same dry, healthy climate which so suits the fine woolled sheep and the rabbit has also left a legacy of unleached fertile soil. This same soil laid bare by the rabbit invasion is a ready-made seedbed for surface sowing—particularly on the shady faces—with better class grasses and clovers. Proof of the natural soil fertility is found in the comparative ease with which grasses and clovers establish, even in the absence of any fertiliser dressing. The urgency of the problem is to provide this cover of better grasses before its place is taken by worthless and aggressive weeds."

After discussing schools of thought on the use of summer and winter country and recently projected further refinements of winter, spring, summer, and autumn blocks, Mr Chapman said the essential principle, arrived at through long experience, was still that successful low-lost farming of extensive grazing country was dependent on a system of assuring winter feed supplies through spelling the winter country by skilled and determined use of summer country. Modification of this principle by extensive development of topdressing involved departure from the practice of low-cost farming and large capital outlay in seed and fencing. To offset this, topdressing might enable a farmer to change his flock to a heavier type of sheep, without detriment to his country, which would give increased and more stable returns from surplus stock, and also to increase considerably his production of beef cattle. Cattle, with their greater flexibility of management, would play an increasing part in the grazing control of improved country. They were already providing welcome diversification in the returns from tussock country, which traditionally had had all its financial eggs in the one basket.

With topdressing of an extensive area of a run fully established, the tendency would be toward autumn use only of the higher country, for both cattle and sheep.

Such extensive development of topdressing would mean a tremendous expansion of the aviation industry, said Mr Chapman, and the high country, with its large individual blocks and ample landing grounds, should open a field for the economic use of larger planes.

The Future of Meat

The great future for the meat export trade, provided present opportunities were seized, was indicated by Mr A. B. Baker in a review of the Meat Producers Board's plans for expanding production and sales. In outlining the immediate policies the board had formulated after the return of the chairman and general manager from the United Kingdom and North America a week before, Mr Baker said he believed there was ground for an optimistic approach to the future.

"I do not want to minimise the difficulties that will be ahead of us in spreading our sales. They are very considerable. We can't hope to have things always our own way, but anyone who approaches timidly this marketing of our increasing export surplus fails to think in large enough terms.

"For the individual producer the aim should be more than ever to increase production as far as is economically and practically possible. The limits to the marketing of New Zealand meat at reasonable prices have certainly not been reached."

A British Viewpoint

That New Zealand would be most unwise to depart substantially from her traditional concentration on the production of standardised quality produce from grass was the opinion expressed by Mr E. G. Griffiths, Agriculture and Food Adviser to the High Commissioner for the United Kingdom in New Zealand. New Zealand farming was admirably placed to compete effectively on world markets.

"I am not saying that the level of prices will be the same as those received under the conditions of shortage since 1939; indeed if consumption is to increase, prices must stabilise at a lower level. That in itself can pose something of an economic problem, but it is a problem which must be faced. Expansion on overseas markets means encouraging consumption and that in turn means selling at prices the consumer is prepared to pay."

In discussing the implications for New Zealand producers and the suggestions widely made of lowering cost of production and diversifying production, Mr Griffiths said that except for the inefficient and high cost producer, it was not easy to make more than marginal savings on the majority of properties without prejudicing future production by making too drastic reduction in essential operations.

"It has been said in Britain that 'low farming is no answer to low prices', and I think it is equally true here in New Zealand. If, therefore, cutting costs means lowering the standard of farming below what is considered prudent for the maintenance of good husbandry, then I am certain it is the wrong policy; it would be too much like the policy farmers in Britain had to adopt during the thirties, and a bitter lesson was learned from that."

Diversification was a most misleading term and any suggestions for widening production which would prejudice the advantages gained from specialisation must be carefully examined. Specialisation was almost essential, said Mr Griffiths, in production for an export trade. He commended the introduction of flexibility into farming systems so that production could be swung within limits between a few specialised lines to suit the changing requirements of overseas markets.

High Production at Low Cost

In a paper emphasising the importance of farmers regarding their operations as a business enterprise Mr R. H. Scott said the time had arrived when those people interested in the use of farm records and accounts as an aid to management should meet to devise standard headings for farm income and expenditure and standard methods of presenting farm accounts and records so that they could be understood by farmers and agricultural advisory workers.

"If this is done," he said, "and public accountants prepare accounts and records accordingly, it should be possible for research people in farm economics to build up standards of production and economic standards for various classes of farms in different land classes. With these standards available it should then be possible to compare any set of farm accounts and records with them, and such a comparison could help in the objective of obtaining greater production more efficiently."

When public accountants already had to prepare some form of accounts for farmers it seemed a waste of time for others like officers of the Department of Agriculture to have to get data from farmers to prepare another set as an aid to advisory work.

The answer to what the Department of Agriculture was doing to convert farmers to farm businessmen was, Mr Scott regretted, "not much", but there was a definite realisation of the need to do something and a beginning had been made.

To bring about simple forms of accounts and records as farm management aids, the farmer would have to keep that irreducible minimum of records and note accurately how he spent money in his farm business.

"By this I am not implying that he should live like a miser. If he has a net profit of £3,000 to £4,000 per annum, I do not care how he spends it, but if he does order his personal spending on such a scale, please don't let this rate of personal expenditure permeate into the expenditure fabric of the farm, unless it is going to result in increased economic production. If it does not result in increasing production, it must inevitably build up a higher cost structure.

"In short, the blueprint outlined will mean a marriage between scientist, extension worker, accountant, and farmer. If this is achieved, even if it is a bigamous marriage, I am sure it will work to the good of New Zealand in helping to produce high-quality foodstuffs at a low unit cost and thus enable us to hold our own in world markets and successfully break into new ones."

Animal Health

Heavy losses from hogget (or lamb) ill thrift and white muscle disease in the district in recent seasons have brought inevitable suspicion of the "improved" methods of farming, the new pasture species, and new fertilising programmes. Finding out whether these doubts have any factual foundation is naturally a protracted business for the research worker, while the farmer losing young stock wants a quick answer. Some of the plant chemistry research into possible causes of metabolic troubles in grazing animals was described in a paper by Dr A. T. Johns, and treatment for the control of white muscle disease that can be recommended on the results of research to date was outlined by Professor J. W. MacLean. A film showing the extent and direction of research projects at the Ruakura Animal Research Station was shown by Dr C. P. McMeekan.

Potential of Foothills

With present knowledge of techniques for tussock sward improvement, the foothills of South Canterbury (530,000 acres) offer a very big potential for increased production. In a paper presenting results of Department of Agriculture trials with oversowing, fertilisers, trace elements, and other nutrients, Mr W. V. Hadfield discussed the management required to make best use of the improved grazing. At present carrying 300,000 sheep and 5,000 cattle, the country reviewed could, over the next 20 to 25 years, carry another 200,000 sheep and 15,000 cattle.—*G.J.N.*

Mr P. W. Smallfield Appointed Director-General

THE appointment of Mr P. W. Smallfield as Director-General of Agriculture was announced last month. He has been Assistant Director-General since April 1957 and succeeds Mr R. B. Tennent, who retired at the end of last month.

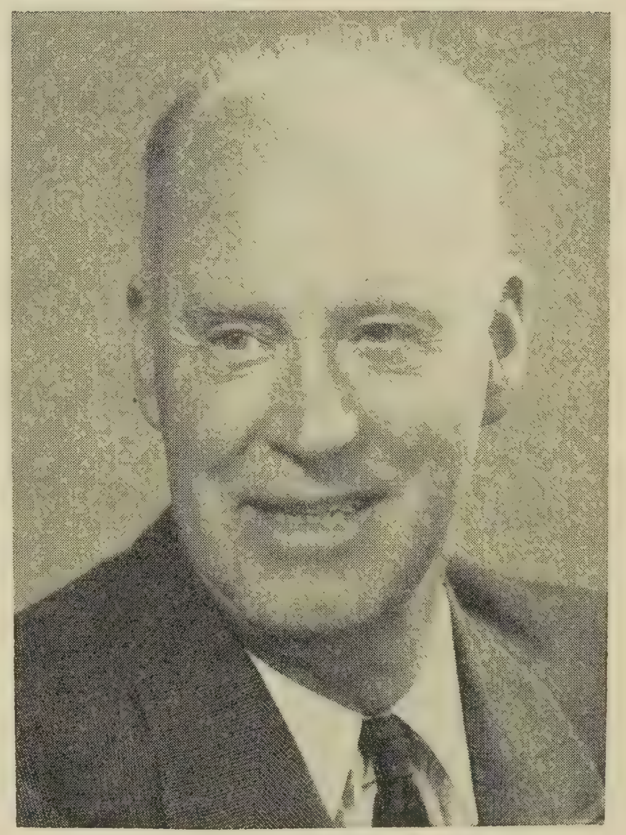
MR SMALLFIELD has had a long and close association with the research and extension services of the Department and as a divisional director has been responsible for the establishment of many new activities seeking data on which to base improved advisory and information services to farmers.

Mr Smallfield joined the Department as Assistant Instructor in Agriculture, Auckland, in February 1921. He was appointed Fields Superintendent, Auckland, in 1928, became Superintendent of the Ruakura Animal Research Station in 1939, and Superintendent of Services Vegetable Production in May 1942. The following year he became Director of the Fields (since 1948 the Extension) Division.

Mr Smallfield visited Pakistan in 1951 to advise on the establishment of a livestock feeding project there which is part of New Zealand's commitments under the Colombo Plan. In 1955 he studied agricultural extension work in England, Scotland, and several states of U.S.A.

He is an acknowledged authority on agricultural research and extension and has written extensively and delivered many papers on these subjects.

Mr Smallfield has served on the consultative committee on agricultural education, the Land Settlement Board and Marginal Lands Board, the Inter-Departmental Committee on Irrigation, and the Dominion executives of the Federations of Young Farmers' and Country Girls' Clubs.

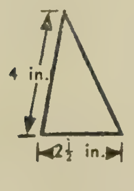


Mr P. W. Smallfield.

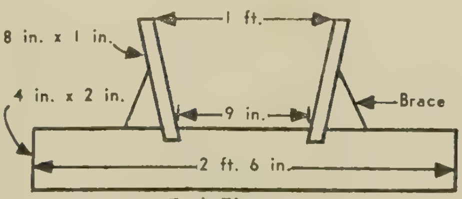
Foot-rot Cradle

THE foot-rot cradle described here has been made and used by Mr Ian Mann, a farmer of Kokonga, Central Otago, when paring the feet of sheep. It is simply made and the materials, 10 ft. of 8 in. x 1 in. timber and 5 ft. of 4 in. x 2 in. timber plus a few nails, are usually available around most shearing sheds.

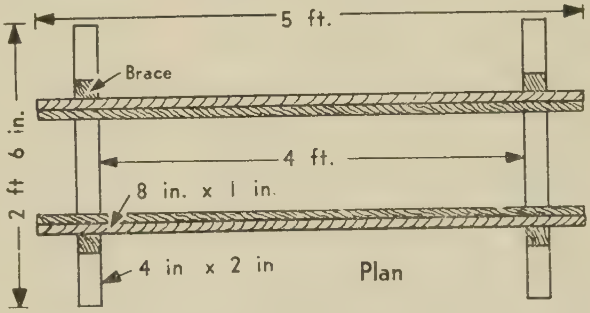
The 4 in. x 2 in. timber is sawn in two and the two pieces nailed to the shed floor 4 ft. apart, midway between the catching pen and port-hole, the 8 in. x 1 in. timber is sawn in two, and the edge of each piece let into the 4 in. x 2 in. timber as shown in the diagram below and each side braced with a triangular block as shown. Timber surfaces which sheep may touch should be dressed.



Brace



End Elevation



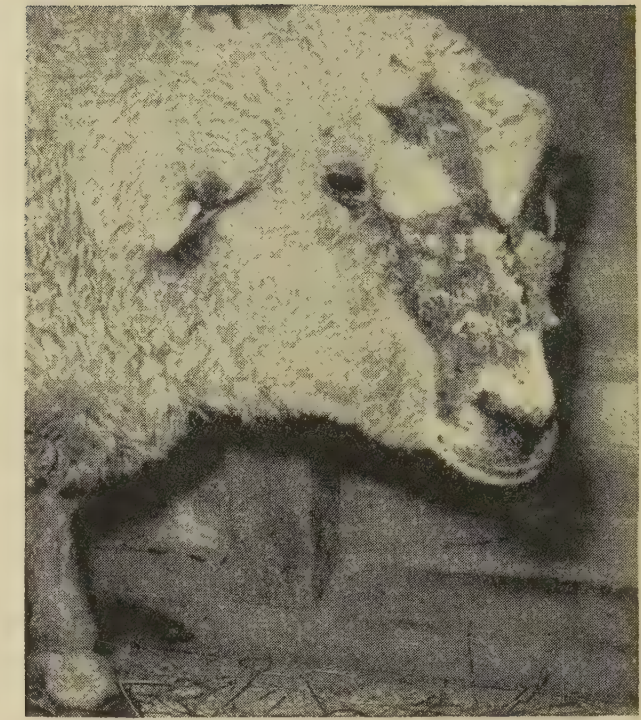
The sheep is laid on its back with its head over one of the 4 in. x 2 in. pieces and is then ready for its feet to be pared.

A low seat can be placed on each side of the cradle if desired, and the operator can sit on one of these.

Sheep are released by the operator taking a fore foot and a hind foot on the opposite side and pulling the animal over toward him. If the cradle is fitted to the floor in line with the port-hole and slightly to one side of it, the sheep will be heading right for the port-hole when released.

—*J. A. MILLER, Livestock Instructor,*
Department of Agriculture, Blenheim

The Story of Facial Eczema Research



By J. F. FILMER, Director,
Animal Research Division,
Department of Agriculture, Wellington

LOSSES from facial eczema in 1955 and 1956 were serious and widespread and similar outbreaks have occurred periodically during the last 60 years or more. It is therefore natural that farmers and others should ask what research has been conducted to determine the cause of this disease and the best methods of preventing it. It is understandable that they are not satisfied with the results obtained and are demanding an extension and intensification of the research programme. This article tells the story of facial eczema research, recounts the difficulties that have been met and shows how some of them have been overcome, reviews the gradual accumulation of knowledge, and indicates the ways in which it is planned to continue the investigations.

THE first official reference to facial eczema is in the annual report of the Department of Agriculture for the year ended 31 March 1908. The late Dr J. A. Gilruth, the Dominion's first Chief Veterinarian, reported:

> "Almost simultaneously from different districts of the North Island outbreaks of this disease [facial eczema] were reported, especially during the month of April . . . . The outbreaks are generally concurrent with a rich supply of grass following upon the breaking up of a more or less prolonged period of dry weather during which the sheep were devoid of succulent fodder. In all these respects the history is identical with that of similar cases observed by me nearly 10 years ago."

He further reported:

> "Various experiments were conducted at the laboratory [Wallaceville] in the attempt to transfer the disease from each of the 5 sheep received with the affection in different stages but without success. As to the bacterial flora of the lesions naturally this was abundant, especially on the excoriated surfaces. As regards the vesicular eruption, tubes inoculated from the youngest vesicles occasionally remained sterile, but those inoculated from older and more or less purulent lesions always developed numerous colonies of staphylococci and various bacilli none of which, however, proved virulent when inoculated into healthy sheep, either by scarification or subcutaneously. A similar fate attended all attempts to transfer the disease by inoculation of the actual material through scarification or otherwise direct from sheep to sheep. Furthermore when the affected sheep were placed with others in no case was the disease transmitted."

These experiments at Wallaceville initiated the facial eczema research campaign which is still going on. During the next 30 years, as occasion offered, the pathology of the disease was studied at Wallaceville and observations were made of the conditions under which the disease occurred in the field.

The Wallaceville studies indicated the nature of the skin lesions and revealed the presence of liver damage. It was found that skin damage occurred only on white or lightly coloured skin which was not covered by wool and that affected animals always sought shade. This indicated that light played a part in causing the skin lesions and suggested that photosensitisation was involved. This is a process whereby skin is rendered unduly sensitive to light which normally would cause no damage. Many photosensitising agents are known, a number of them being contained in plants of which St. John's wort is a well known example in parts of the South Island.

The liver damage was found to be of a particular type which is easily recognised by microscopic examination and this enables facial eczema to be readily differentiated from other diseases in which liver damage occurs.

Field studies confirmed Gilruth's observations that facial eczema followed warm autumn rains and was more likely to occur after hot, dry summer periods in which pasture growth was depressed.

In an article published in the February 1938 issue of the "Journal of Agriculture" J. E. McIlwaine, now Director of the Animal Industry Division of the Department of Agriculture, after referring to the serious outbreak of 1935, wrote:

> "Although one does not wish to enter the sphere of the prophet in predicting an outbreak of the disease this year, at the same time we are advised that the summer is likely to be a dry one and in such circumstances the outbreak of 3 years ago was a very serious matter for sheep owners."

In the 2 months after the publication of this article New Zealand experienced its most disastrous outbreak of facial eczema.

Facial Eczema Management Committee

After this outbreak the Government set up a Facial Eczema Management Committee to plan and direct a long-term programme of investigations with a view to determining the cause of the disease and providing methods of control. Ample funds were provided and since then succeeding Governments have met all the requests made for money to finance facial eczema research.

At the end of the 1938 outbreak the following knowledge was available: The primary lesion was in the liver and the losses from facial eczema were due to the effects of liver damage. In severe cases this damage was so great that there was no possibility of the liver regaining its normal condition. In less severe cases sufficient regeneration occurred to enable the liver to function normally unless it was exposed to some unusual strain such as that imposed by lambing or calving. The liver damage was sometimes but not always associated with jaundice and photosensitisation. Outbreaks of facial eczema occurred after warm autumn rains and more frequently on improved pastures than on hill country carrying pastures dominant in danthonia and browntop. All efforts to transmit the disease from affected to healthy sheep had failed and there was no reason to consider that facial eczema was infectious.

Work in South Africa on a related disease known as geeldikkop (literally, yellow bighead) had shown that the photosensitisation in that disease was due to phylloerythrin. This is a substance produced from chlorophyll in the gut of the grazing animal. In normal animals it is excreted in the bile, but certain types of liver damage cause it to accumulate in the blood and render the animal photosensitive. It was suspected that the photosensitisation in facial eczema was due to phylloerythrin.

With this background of knowledge it was decided to undertaken investigations along the following lines:

Dr J. A. Gilruth, the Dominion's first Chief Veterinarian, who made the first official reference to facial eczema in the Department of Agriculture's annual report of 1908. His experiments at Wallaceville attempting to transfer the disease from affected to healthy sheep started the facial eczema research campaign that is still proceeding.

1. Field surveys to define as accurately as possible the conditions under which facial eczema occurred.

2. Studies of the after effects of facial eczema in ewes to indicate how they should be handled.

3. Studies of the photosensitisation to determine if phylloerythrin was in fact responsible.

4. Experiments designed to discover what caused the liver damage.

5. Attempts to discover practical methods of controlling the disease.

The investigations conducted under these headings will be described separately, but it should be realised that they were often undertaken concurrently.

Field Surveys

Very detailed surveys were made of a number of affected farms in the Waikato district in 1938 by five veterinarians and five agriculturists working in pairs. These surveys began on 30 March 1938 between the two outbreaks which occurred in that year and continued for 2 months. Surveys were also made by officers of the Grasslands Division of the Department of Scientific and Industrial Research in both the Waikato and Bay of Plenty districts and reports from officers of the Fields Division from all North Island districts were correlated by the Director, Grasslands Division.

In July 1938 one veterinarian and one agriculturist began a 2-year study of 12 affected farms in the Waikato district concerning which they made detailed monthly reports. In November 1938 a physicist was appointed to supervise the keeping of weather records on these farms and on the research stations. Grass minimum and earth thermometers and rain gauges were supplied to the farmers and a very full range of weather observations was made on the research stations.

From these surveys and from field observations and weather recordings made since, much valuable information has been obtained. This has served as a basis for the investigations conducted at the special facial eczema research stations and in the laboratories. This is the natural sequence in research. Field surveys point the way for the investigation and their continuance is seldom justified after the planned investigation has been started.

Unfortunately such investigation is confined to a few places and seldom comes under the notice of farmers whose stock are affected and who are inclined to believe that research workers would learn more from studying field outbreaks than from experiments conducted in laboratories or research stations. Experience does not support this view.

Studies of After Effects of Facial Eczema in Ewes

Forty-four ewes which all showed skin lesions of facial eczema during April 1938 were kept under continuous observation at Ruakura. Nineteen of these were classified as severe cases. Jaundice continued for a relatively short period and could be detected in only a few cases by the end of May. Skin lesions had all healed by the end of June, but some eye lesions were permanent, probably due to infection or injury. There were a number of recurrences of photosensitisation during the spring of 1938 and a few in subsequent autumns and springs. The mortality rate and lambing record are summarised in the following table:

Year	Alive at lambing	Lambed	Lambs dropped	Lambs fattened
1938 ..	44	19	22	17
1939 ..	24	15	17	16
1940 ..	19	9	9	9

A further 4 ewes died after lambing in 1940. At the end of this year there were thus 15 survivors from the original 44. All survivors were then in good condition.

Most of the deaths occurred during winter or immediately after lambing. Heavy infestations with the large stomach worm (*Haemonchus contortus*) occurred during autumn. Survivors regained condition each summer. Lambs grew at normal rates and fattened well.

At the end of 1938, 9 deaths had occurred from facial eczema and 3 from other causes and 17 lambs were fattened. There would thus have been available for sale 32 ewe fleeces, 32 ewe carcasses, and 17 lamb carcasses.

In a subsidiary experiment at Ruakura a concentrate supplement was fed to half of a group of affected ewes to determine if this would hasten recovery. There was no significant difference in the recovery rate of the concentrate-fed ewes and those which received pasture only.

In a later outbreak Ruakura studied 50 clinical and 50 sub-clinical cases. The 50 clinical cases were all suffering from severe photosensitisation and loss of condition. The 50 sub-clinical showed no photosensitisation, but their condition was typical of ewes with badly affected livers. They were derived from a flock of 1,200 ewes from which a sample killing of 100 ewes, showing no photosensitisation and selected at random, showed 100 per cent severely affected livers.

The following results were observed:

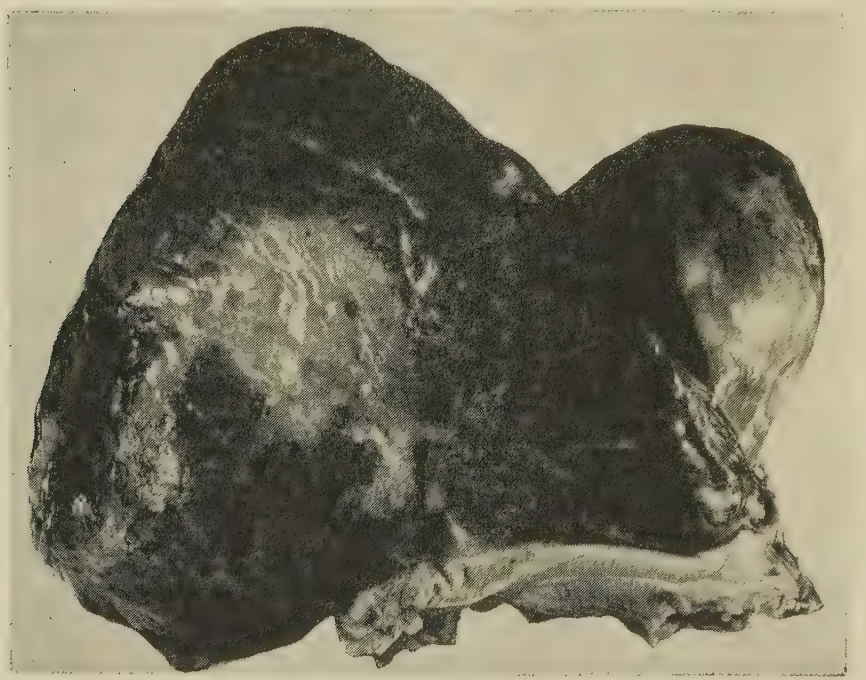
	Alive at lambing	Died later	Lambed	Lambs dropped	Lambs fattened
Clinical	32	6	7	7	7
Sub-clinical ..	41	6	15	17	15

From these and other observations it has been concluded that a conservative policy should be adopted in dealing with affected ewes. All but the worst of these should be given a chance to fatten rather than being sacrificed while still affected. It is doubted, however, if survivors should be again mated, especially if they lose condition at or after the first lambing after they contract facial eczema.

Studies of Photosensitisation

From 1938 to 1943 a comprehensive series of experiments was conducted at Wallaceville. These involved the injection of phylloerythrin into normal sheep, the chemical examination of the blood and urine from these sheep and from cases of facial eczema, and the determination of the types of light which produced photosensitisation in facial eczema and in sheep injected with phylloerythrin.

It was demonstrated that phylloerythrin is the photosensitising agent in facial eczema. As this substance accumulates in the blood only when the liver is not functioning properly, it was concluded that liver damage is responsible for the photosensitisation. As liver damage is also responsible for loss of condition and death in sheep which do not show skin lesions, it is obvious that it is the important factor in facial eczema. Cases in which photosensitisation does not accompany liver damage are probably due to the liver being able to divert phylloerythrin into the bile when liver damage occurs slowly, even though it may eventually be quite severe.



Liver damage of animals contracting facial eczema was found in early research to be of a particular type easily recognised by microscopic examination. This enables the disease to be easily differentiated from others causing liver damage. Illustrated above is a liver badly affected with facial eczema, showing gross distortion and extreme development of white fibrous tissue.

Search for Liver-damaging Factor

More than 20 different diseases have been described in various parts of the world in which liver damage and photosensitisation occur. In nearly all of these a plant is known or suspected to cause the liver damage. It was therefore natural to suspect a plant as the cause of facial eczema. Careful examination by botanists and a mycologist of paddocks in which facial eczema occurred in 1938 failed to incriminate any weed or fungus. The hypothesis was therefore propounded that facial eczema was caused by a liver-damaging factor developing in one or more pasture species after warm autumn rains.

It was also realised that the liver-damaging factor could have resulted from a variation in the concentration of some of the normal constituents of pasture. This prompted a comprehensive series of analyses of pasture samples from paddocks in which facial eczema had occurred or was expected to occur and a parallel series of analyses of samples of normal pasture. This involved the whole-time efforts of a considerable number of chemists for about 2 years. It produced useful information about the relative composition of mature and immature pasture.

Rapidly growing autumn pasture was also examined for the presence of unusual compounds and a series of hitherto undescribed alkaloids was discovered. It was shown, however, that these were not responsible for the liver damage.

It is not surprising that chemists at this stage made no progress toward identifying the liver-damaging factor, as it is doubtful if any of the pasture examined by them contained it. Field evidence showed that if healthy lambs were introduced into a paddock as soon as sheep grazing in it showed signs of facial eczema, the new lambs remained healthy. This meant that if facial eczema was caused by the eating of toxic pasture, the pasture did not always remain toxic after symptoms had appeared. Pasture therefore had to be collected before symptoms appeared, but first it had to be shown that facial eczema was in fact caused by a liver-damaging factor in pasture.

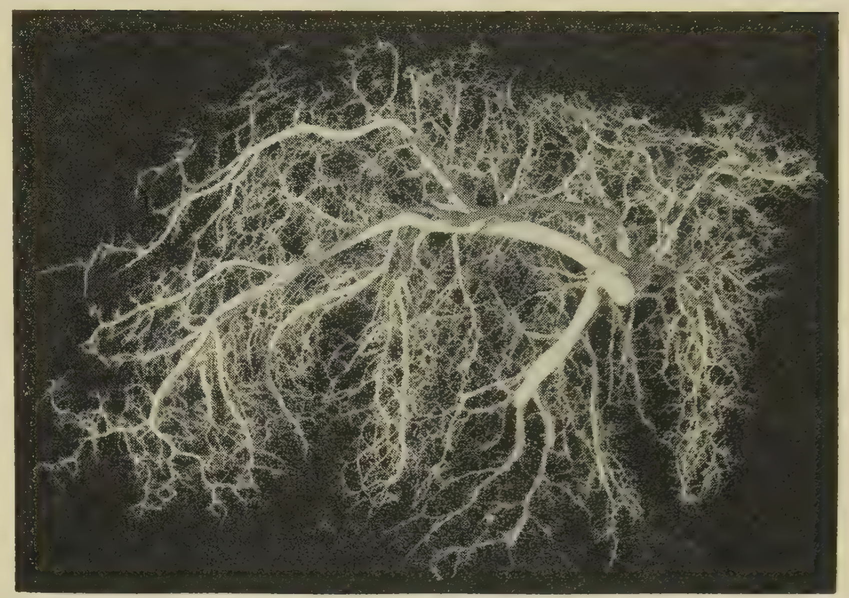
The first attempts to do this were made on an area of 40 acres leased on a farm at Karamu, about 10 miles south-west of Hamilton. These attempts failed because, though facial eczema was reported to have occurred annually for a number of years on the area, no clinical facial eczema and very little liver damage occurred there in 1939 and 1940. This situation recurred many times in the course of the facial eczema investigation.

The first significant success was achieved in 1941 on 10 acres leased at Whakaki, about 10 miles east of Wairoa. A serious outbreak of facial eczema occurred in experimental lambs grazing this area during March. Pasture was mowed daily from the area from January to April and fed green to penned lambs. Definite liver damage was produced in some of these. This greatly strengthened the hypothesis that liver damage was due to a substance in the pasture, but before the chemists could start their task some means had to be found of preserving the pasture which did not destroy the liver-damaging factor.

Freezing had been tried at Karamu in 1939 and 1940, but results were inconclusive because the growing pasture was only slightly toxic. With the removal of the experimental area to the east coast freezing appeared to be less attractive, as the transport of frozen grass in large quantities to the chemistry laboratories at Wallaceville and Ruakura would have presented difficulties.

In 1942 grass was preserved by boiling and sealing in tins and small quantities were preserved in alcohol. No liver damage occurred in lambs grazing on the experimental area in that year.

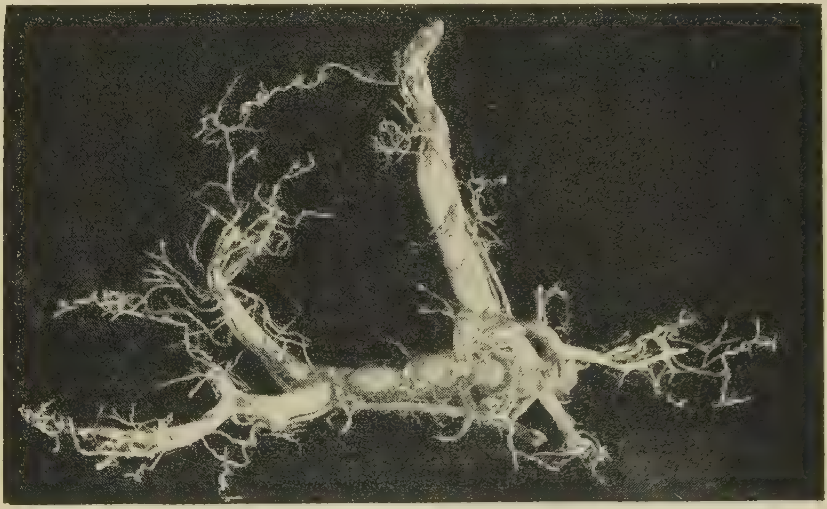
To determine whether grass remained toxic after preservation, it had to be fed to lambs and experience showed that from 100 to 250 lb. of green grass was necessary for a test with a single lamb. This presented real difficulties with preservation in alcohol, which for obvious reasons would have to be evaporated off before feeding. This method was continued only on a small scale which proved very useful for the alkaloid extraction already mentioned.



That the primary lesion was in the liver and that losses from the disease were due to the effects of liver damage were established early in investigations. In severe cases damage is so great that there is no possibility of the liver regaining its normal condition.

ABOVE—Cast from normal sheep's liver. The white vessels are the bile ducts and the darker vessels the hepatic artery and its branches.

BELOW—Cast of bile duct system from the liver shown on opposite page. Most of the small bile ducts have disappeared and the main ducts are grossly enlarged. The smaller vessels running parallel to the main bile ducts are the hepatic artery and its branches.



In 1943 grass was preserved by boiling and by drying. Boiling presented many problems. Kerosene tins were first used but were not strong enough to stand the strains set up during heating and cooling. Eventually, with helpful advice from commercial canneries, grass was successfully preserved in 378 tins holding approximately 6 lb. of green grass each.

Grass was dried by drawing air from a coke furnace by an electric fan and forcing it through layers of pasture held in trays. In this year about 2 tons of grass was dried from the experimental area at Whakaki and from selected paddocks in Gisborne and Wairoa districts. Fortunately severe liver damage occurred in lambs grazing these areas.

The preserved grass was sent to Wallaceville, where it was fed to lambs and guinea pigs. The boiled grass produced only very mild liver damage in 1 of 2 lambs and in none of 6 guinea pigs. Dried grass produced liver damage in varying degree in 10

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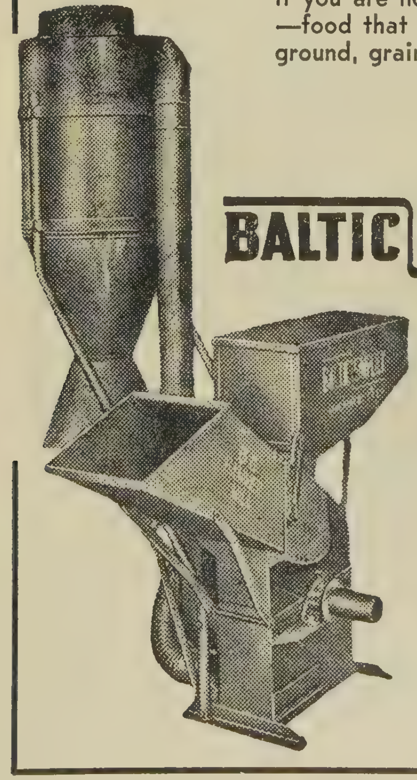

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out of 11 lambs and in 13 out of 39 guinea pigs. It was thus shown that the toxicity of grass could be preserved to at least some extent by drying. Another forward step had been made.

The relatively small percentage of guinea pigs showing liver damage made this animal appear unreliable for test purposes. This was unfortunate, as the daily ration for even a mature guinea pig is only about 1/10 that for a lamb. Since 1943 heat drying has been adopted as the standard method for preserving pasture and a total of about 6 tons of dried toxic grass has been obtained.

Test for Toxic Pasture

A method of determining which pasture was toxic had to be developed. The only test available was the reaction of the grazing lamb. It was hoped that a test could be found which would show when the liver suffered damage. A number of different methods were tried involving many thousands of individual tests, but none detected liver damage unless this was accompanied by jaundice.

Eventually the system which is now used was evolved. Five 2-acre paddocks which have a bad history for facial eczema are kept short during summer by either overgrazing or mowing. In January some 300 lambs are bought from a hill farm before any liver damage occurs. From 40 to 60 of these are placed in one of the 2-acre paddocks and then rotated through the 5 paddocks, spending 2 days in each. The remaining lambs are grazed on crops, usually turnips or thousand-headed kale, which do not produce facial eczema, until they are required.

When the first autumn rains fall 10 lambs are introduced into the experimental paddocks and thereafter a further 10 are introduced each week until the weather cools, usually late in April. Two of the large group are removed each week; 1 is killed immediately and the second is grazed for 3 weeks on crops and then killed. The latter procedure has been adopted because it has been found that liver damage progresses after feeding on toxic pasture has ceased.

The smaller groups are removed after 3 weeks in the experimental paddocks. Five are killed immediately and the remaining 5 after 3 weeks' grazing on safe crops. All livers are carefully examined for damage.

From the time of the first autumn rains until cold weather follows in late autumn pasture is mowed daily and dried. Each day's cut is labelled with paddock number and date. The dried grass which was toxic when growing can thus be identified; for example, in 1950 the livers of all lambs killed up to 27 March were normal and livers of all lambs which entered the paddock on or after 4 April were normal. Livers of lambs which grazed during the intervening period showed some damage and it was thus obvious that pasture was toxic during some part of that period and non-toxic before and after it.

[*Niederer*

Definite liver damage produced in penned lambs fed green grass mown from an area near Wairoa on which there was a serious facial eczema outbreak in 1941 was the first significant success in establishing that the disease was caused by a liver-damaging factor in pasture. In 1943 liver damage was produced in experimental lambs fed dried grass, but at least 25 lb. had to be fed to each lamb. Discovery that typical liver damage could be produced in young guinea pigs has now made it possible to carry out tests with approximately 2 lb. Illustration shows dried grass samples being weighed into standard quantities at Ruakura for feeding to guinea pigs to determine toxicity of the pastures from which the grass was collected.

Chemical Investigations

Ever since it was demonstrated in 1943 that the liver-damaging factor could be preserved in dried grass chemists have been endeavouring to isolate the responsible substance. They had no clue to its identity and its only known characteristic was that it produced liver damage. Every extract prepared had to be fed to a lamb. At least 25 lb. of dried grass was required for each test and it had to be fed over a period of 3 weeks or more.

Supplies of toxic grass became available at irregular intervals, the toxicity was often rather low, and it tended to disappear when the grass was kept for long periods. This is now prevented by keeping the dried grass in cold storage. The irregularity of supply is indicated by the following data from the Manutuke experimental area.

1944	Toxic grass collected on 36 days
1945	Toxic grass collected on 51 days
1946-48	No toxic grass collected
1949	Toxic grass collected on 19 days
1950	Toxic grass collected on 17 days
1951	Toxic grass collected on 9 days
1952-54	No toxic grass collected
1955	Toxic grass collected on 1 day
1956	Toxic grass collected on 1 day
1957	Toxic grass collected on 21 days

Before 1952 the toxicity of the dried grass could be tested only by feeding it to lambs and the toxicity of each day's collection could not be tested. The probable toxic period was determined by reference to the liver damage which occurred in lambs grazing the experimental area. Grass collected during this period was mixed and fed to lambs.

The results in 1955 and 1956 were most disappointing. Grazing lambs developed liver damage over considerable periods and clinical cases occurred in both years. The same dryer and the same techniques were used as in previous years. However, feeding experiments with the dried grass showed that toxicity had been preserved on only 1 day in each year. Fortunately small supplies of toxic grass became available from some areas in the Waikato. In 1957 over 2 tons of toxic dried grass was collected from Manutuke and other

Grass samples collected from selected areas being mixed to ensure complete drying in a coke dryer at Ruakura.

Poverty Bay areas and at present adequate supplies are available for the first time.

The difficulty of collecting toxic pasture early prompted efforts to grow it by simulating the weather under which facial eczema occurs. As early as 1939 efforts were made to grow toxic pasture under glass and on artificially heated soil outside. Further efforts were made in 1956 and 1957 with improved facilities. Unfortunately these efforts have so far failed, but they are being continued.

The first toxic extracts were produced in 1952 and since then considerable progress has been made. This was greatly assisted by the discovery that very young guinea pigs are fairly sensitive to the liver-damaging factor. Tests can be made with them using extracts from about 2 lb. of dried grass. Toxic extracts have now been prepared which contain only a 1/100,000th of the original dry matter. However, even at this concentration the chemical reactions are very similar to those from extracts made from non-toxic grass. Only feeding tests can differentiate with certainty between corresponding extracts from toxic and non-toxic grass. Identification of the liver-damaging factor is proving very difficult.

There has, however, been one encouraging chemical development. During the extraction of toxic pasture it was observed that a deposit appeared on the walls of the beaker in which the extract was evaporated. This gave rise to the so-called "beaker test". The deposited substance is not the liver-damaging factor and is in fact not toxic, but its presence indicates toxicity with reasonable accuracy at least in the earlier part of a toxic period.

As the test requires only about 2 oz. of dried grass and can be completed in a few hours, it promises to be very useful. It is hoped to use it in spotting toxic pastures for collection and perhaps in identifying toxic species, in following the development and the level of toxicity in relation to weather, and possibly in breeding non-toxic strains of ryegrass.

Development of Means of Preventing Disease

From 1941 to 1944 comprehensive daily weather observations were recorded at the experimental area at Whakaki and similar observations have been made at Manutuke since 1945. It has thus been possible to correlate the occurrence of liver damage with weather over 18 years.

From these data three observations have emerged. Facial eczema tends to occur more frequently after summers which are hotter than normal. In those years it is precipitated by warm autumn rains. Not all warm autumn rains induce facial eczema and there is still no means of differentiating between those which are followed by facial eczema and those which are not.

The demonstration of a liver-damaging factor in pasture and its association with weather has enabled preventive measures to be devised. As facial eczema is caused by the consumption of toxic grass, it can obviously be prevented by ensuring that toxic grass is not eaten. This can be done in a variety of ways.

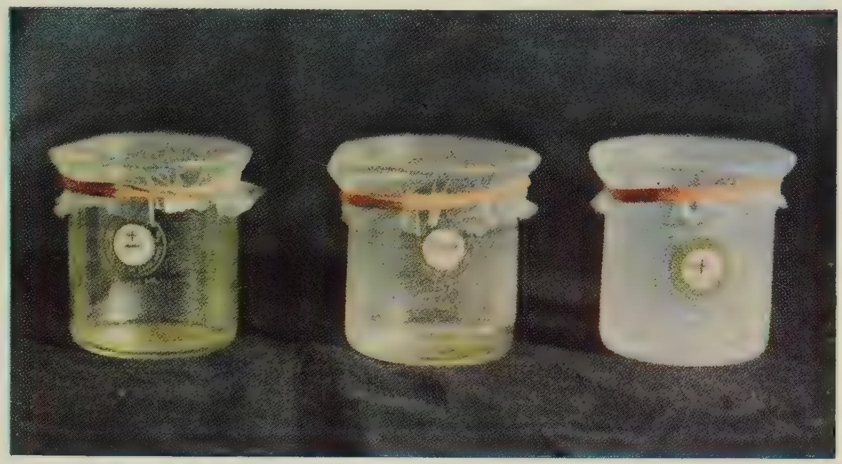
Brassica crops and pure white clover swards do not produce facial eczema, so sheep can be grazed safely on them during dangerous periods. Where safe crops are not available stock can be protected by being concentrated in small areas and thus reducing the consumption of toxic grass to a minimum. Hay and/or silage are fed to prevent undue loss of condition.

By this means facial eczema has been prevented at Ruakura during the last 15 years, though it is known that pasture was dangerous in 6 of those years.

It may well be that some means will be discovered of preventing pasture from becoming toxic. In 1938 it was observed that mature pasture was less toxic than the rapidly growing pasture which appeared after warm autumn rains. Efforts were made to provide mature pasture for autumn grazing by shutting up paddocks in summer. This procedure did not prove successful, probably because sheep tended to graze the areas in patches and then to concentrate on the young pasture growing on those patches.

Field observations in the Waikato from 1943 onward have shown that this method cannot be relied on to prevent facial eczema. The method, however, may well prove useful as a means of reducing the incidence of the disease on hill country and it will be further tested for this purpose.

It has been suggested that the application of trace elements, such as copper and cobalt, might prevent facial eczema. In a small experiment conducted by the Grasslands Division of the Department of Scientific and Industrial Research the application of these elements did appear to give some protection, but copper was applied at a dangerously high level. In a larger experiment at Manutuke neither copper nor cobalt nor the two combined gave any protection when applied at safe levels.



One encouraging chemical development has been the discovery of the so-called "beaker test" in which a deposit appearing on the walls of the beaker during extraction of toxic pasture indicates toxicity of the sample with reasonable accuracy at least in the earlier part of a toxic period. It offers a fairly rapid field test of possibly great assistance in several aspects of the research. The heaviest deposit on the beaker on the right is fairly likely to indicate a toxic sample.

Fungi or other micro-organisms growing in the soil or on the plants have frequently been suggested as the cause of facial eczema. It can be stated with some certainty that facial eczema is not due to infection of the animal by any living organism. The concentrated extracts which have produced liver damage certainly do not contain any living infection.

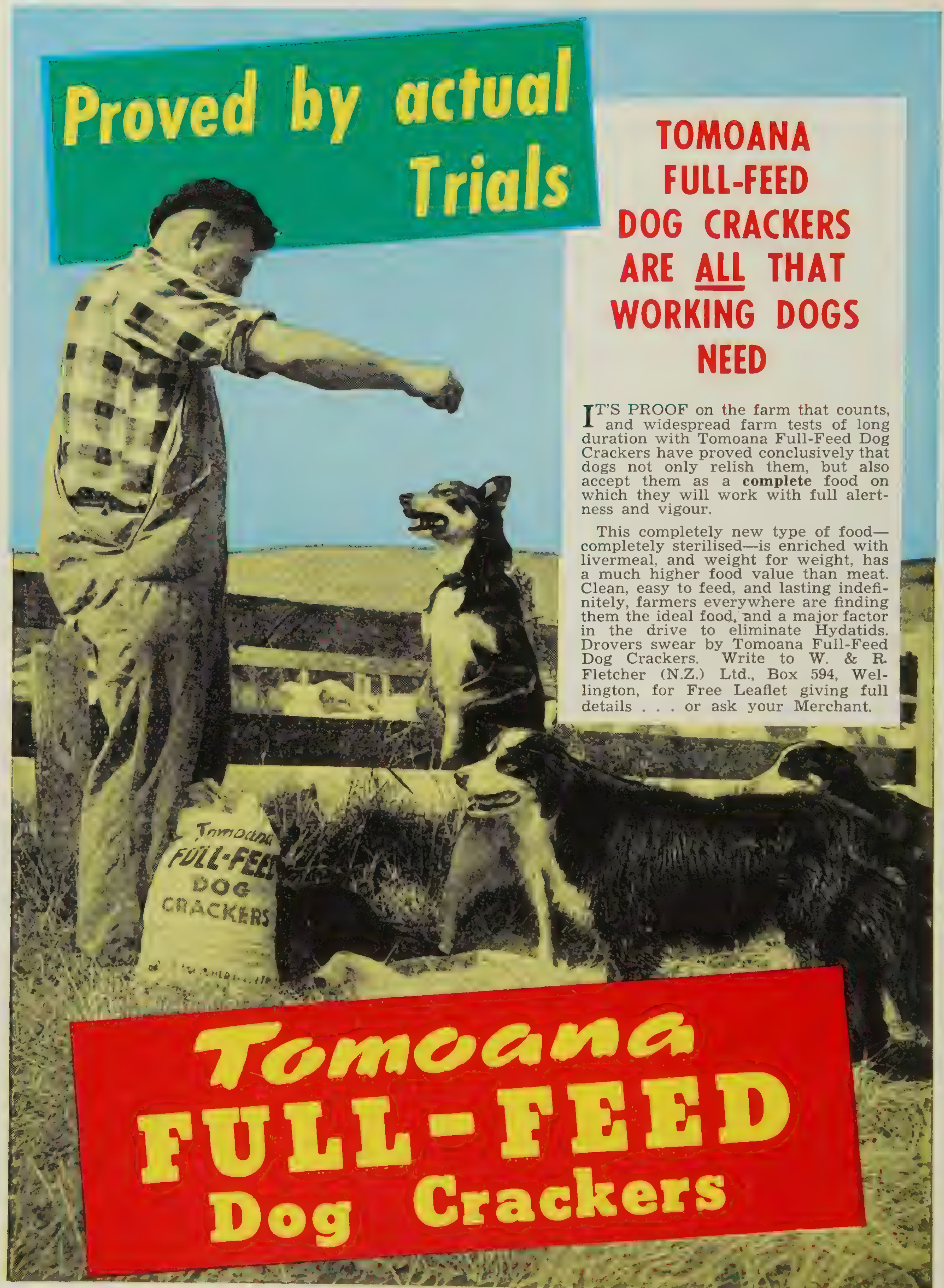
However, a fungus or other micro-organism could produce the liver-damaging factor either in the soil or in the plant. It has been suggested that the heavy dressings of copper may have succeeded by acting as a fungicide. Experiments in which other fungicides beside copper will be used are planned to test this hypothesis.

Substances are now available which depress rates of growth of plants. The effects of these are being tested to see if they can be used to control facial eczema.

This article has been written to give readers some idea of what is involved in the study of a problem as intricate as facial eczema. Though progress has been slow, the position has been reached where the problem has been fairly clearly defined and knowledge and techniques are now available to attack it intelligently.

It would be foolish to forecast spectacular and early success, but the assurance can be given that the investigation will be continued with perseverance and vigour until the cause of facial eczema is clearly understood and the most effective possible means of control provided.

Preventive measures are based on ensuring that toxic grass is not eaten. Brassica crops and pure white clover swards do not produce facial eczema. Illustrations show (left) sheep on a chou moellier crop and (right) concentrated in a small area and fed hay at Ruakura Animal Research Station, where such measures have prevented outbreaks at the Station during the last 15 years, though it is known that pasture was dangerous in 6 of those years.



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Nassella Tussock Control:

Preventing Reversion

By J. P. BEGGS and W. F. LEONARD,
Instructors in Agriculture, Department of Agriculture, Blenheim

Area previously infested with nassella tussock which was sprayed with TCA and oversown with grass and clover. The strike was very good (as shown by this illustration). The present problem is control of seedling nassella, which can be seen coming up through the pasture.

THE nucleus area of nassella tussock at the Wrekin, Marlborough, has now been practically killed completely by judicious use of the weedkiller TCA followed by oversowing of grasses and clovers. Though the kill of the old tussock and the establishment of pasture have been excellent, there has been evidence of the danger of gradual reversion to tussock as a result of re-establishment from seed lying in the ground. To investigate the possibility of controlling this seedling regrowth without seriously damaging the established pasture two experiments were laid down as follows.

1 On an area oversown with white and subterranean clovers in May 1956, after killing of heavy tussock with TCA in the previous summer, a single plot treatment of TCA was applied in January 1957. Seedling regrowth had started to appear in this area and it was felt that least damage to the clovers would result by applying the weedkiller when the subterranean clover was completely dormant. The treatment applied was 25 lb. of TCA per acre with water as the carrier at 60 gallons per acre.

This treatment completely eliminated the seedling nassella tussock without causing any serious lasting damage to the clovers. However, though the subterranean clover re-established vigorously in autumn without showing any effect from the weedkiller treatment, damage became apparent later and did not disappear entirely until the following summer. Similar damage occurred with the white clover. The clovers were not killed, but stunting of plants resulted in some opening out of the cover.

However, by autumn 1958 the area had practically normal clover cover again with no seedling tussock apparent.

2 In March 1957 seedling nassella tussock in a sown pasture composed mainly of perennial ryegrass, cocksfoot, and white and subterranean clovers was treated with dalapon and TCA at varying rates. Dalapon was applied at 2½, 5, 10, and 20 lb. per acre and TCA at 10 and 20 lb. per acre. Both weedkillers were sprayed on with water at 25 gallons per acre.

The time of application was not suited to the avoidance of clover damage, as the subterranean clover was in the tender seedling stage. Spraying in the summer period when this clover is dormant should result in less damage to the sward.

The control of the tussock was very good on all plots. In fact, all seedlings were eliminated except one plant on the 10 lb. TCA plot. However, damage to the sward varied considerably with the rate of application of the weedkiller, being most severe with dalapon at 20 lb. per acre.

In the early spring after treatment the proportion of bare ground on this plot reached 90 per cent, but improved to 40 per cent by early summer. The only useful species surviving here were a few plants of ryegrass and a trace of white clover. On the 2½ lb. dalapon plot the only species seriously affected was subterranean clover; it was practically eliminated. White clover was checked but recovered fully, and the ryegrass and cocksfoot were almost unaffected at all stages. Bare ground on this plot reached a peak (15 per cent) by early spring, but recovered rapidly to 5 per cent. Pasture damage on the other two dalapon plots was intermediate between that on the 2½ and 20 lb. plots.

The TCA treatments at 10 and 20 lb. could be compared with dalapon at 2½ and 5 lb. respectively in regard to severity of damage to the sward. However, TCA was more selective than dalapon, because though all treatments virtually eliminated subterranean clover, 10 lb. TCA had no apparent effect on white clover. Ryegrass and cocksfoot also were unaffected.

As reversion to tussock following weedkiller treatment and oversowing is likely to be an important problem in all future work in the control of nassella tussock, research work of the type just described is of great importance. Further experiments with low applications of weedicides to determine the most appropriate time and rate of application would be well worth while.

Footnote: It should be appreciated that the time of application of chemicals for the control of nassella tussock is very important both for the killing of the tussock and for the avoidance of damage to the desirable sown species. Investigations in both Marlborough and Canterbury have demonstrated this.

◆

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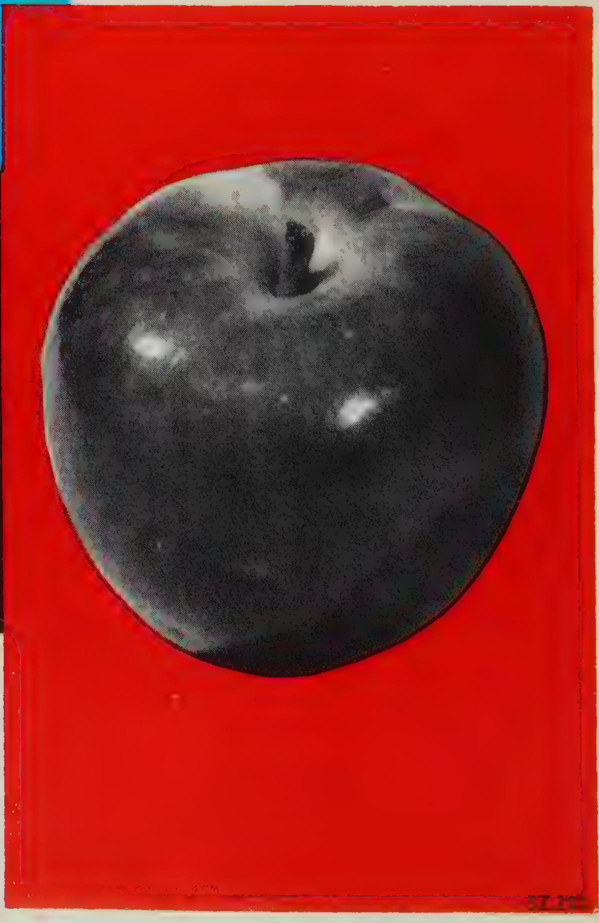

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A paddock under spray irrigation.

Profit from Irrigation

By B. T. JORDAN,

Instructor in Agriculture, Department of Agriculture, Tauranga

THOUGH there is still a considerable amount of investigation to be done before spray irrigation can be recommended in most districts, its use has yielded very profitable returns on at least one North Island soil type. Along the coast of Tauranga County, extending from Mount Maunganui to the Maketu Estuary, there is a narrow strip of soil derived from Aeolian sand, light in texture and subject to droughts from November to April in most years. For many years this land has been regarded as a low-producing soil type, but one dairy farmer, Mr R. Evans, of Kairua, has proved that its potential is just as high as that of any other coastal soil provided water is applied in times of drought. Frequent applications of water that are started well before the onset of dry weather have resulted in success in areas where other farmers have failed.

THE rainfall along the coast of Tauranga County is about 58 in. annually, but from November to April on this coastal strip of sand country it fails to provide enough moisture for adequate plant growth.

The area of Mr Evans's property is 100 acres, which he began farming on his own account in the 1954-55 dairy season. Before this the farm was portion of a larger unit of 200 acres which was owned by Mr Evans's father, for whom the son was share-milking.

Before the introduction of irrigation in 1953-54 a crop of white-fleshed turnips was grown yearly, seed being sown early to take advantage of spring growth before the dry weather set in during November. Today, two crops of turnips, each of 4 acres, are grown each year, one sown early and grown without irrigation and the other sown later and grown under irrigation. The latter crop has played no small part in improving the late summer production from this property.

Experience has shown that on this light soil the turnip crop gives better results when watered for 2 hours at 3-day intervals rather than when given 6 hours of watering once a week. The heavier and less frequent application of water tends to cause crop damage.

When to Irrigate

About one-third of the 100 acres Mr Evans is now farming is irrigated every year. Experience has shown that watering must start early, well before the onset of dry weather, so that pastures can be kept growing without a check. This was proved during the first year that irrigation was used, in the 1953-54 season, when watering started far too late and too small an area was watered compared with the total farm area.

THE GRIFFIN

Half eagle, half lion, the Griffin was well equipped for its job of guarding jewels and gold from the marauding tribes of Central Asia. As a change from guard duty the Griffin would snatch up a horse or a pair of oxen and carry them home for immediate consumption. Had the local farmers spent less time dancing with rage they probably would have formed a League for the Prevention of Griffins and Other Monsters.

Times have changed and the modern farmer has a sounder appreciation of his problems. Griffins and other creatures of the imagination have given way to the familiar diseases of today.

T.V.L. would be helpless if confronted by a Griffin, but, happily, is able to help the farmer to combat his present-day enemies, the bacteria and parasites which constantly threaten the health of his stock.

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Results from Irrigation

The following figures show how irrigation has benefited the production from this area.

Year	Total production of butterfat lb.	Percentage of total production obtained from January to May
200 acres (not irrigated)—		
1950-51 ..	27,339	32.3
1951-52 ..	32,559	31.8
1952-53 ..	32,334	34.0
1953-54 ..	29,714	28.6
100 acres (one-third irrigated)—		
1954-55 ..	21,287	35.5
1955-56 ..	21,533	36.0
1956-57 ..	22,647	38.0

Because of the extra feed available as a result of irrigation Mr Evans is now able to start closing pastures for autumn saved pasture in early April and good growth comes away before the onset of cold weather. Thus irrigation is also giving considerable assistance in the provision of feed for early calvers.

An unirrigated paddock on the farm.

▼ A pasture 7 days after being irrigated with a spray plant.

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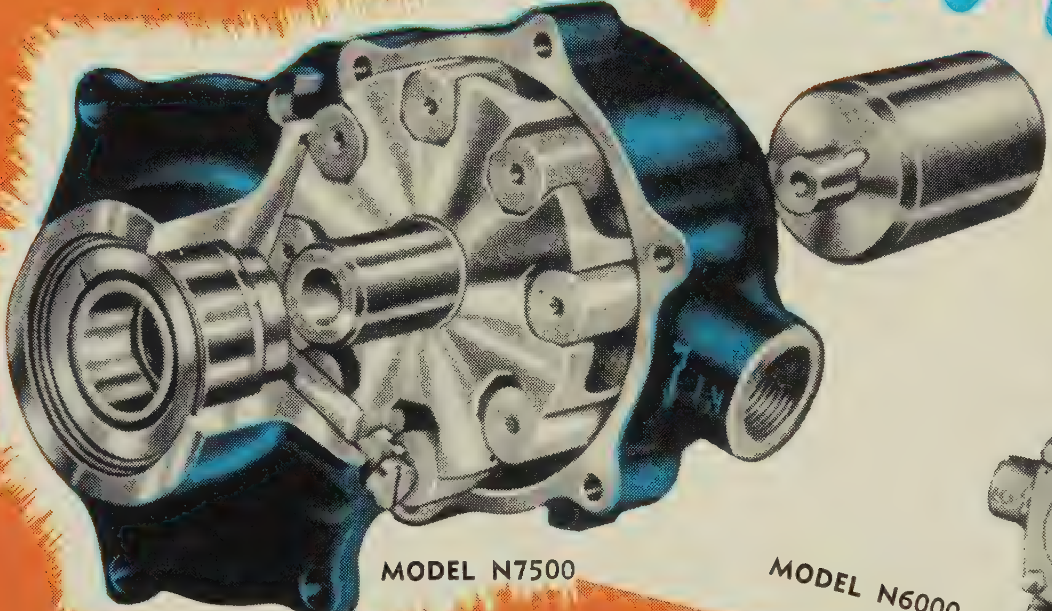

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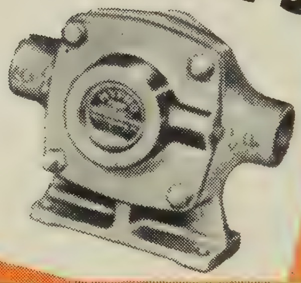

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Both pumps have ample volume and pressure for insect spraying through either the boom type sprayer, or cluster jet equipment. Use it to spray weeds in pastures and to control insect pests on crops.

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Increase in Pig Meats

A further benefit obtained from irrigation has been a marked rise in the total quantity of pig meats produced, due, of course, to the greater quantity of skim milk available over summer and autumn. Before the use of irrigation pigs brought in between 6d. and 7d. per pound of butterfat, and today similar returns per pound of fat are being obtained, thus yielding a greater return per acre from the pigs with only a little extra outlay for buildings.

Valuation of Two Areas

A valuation of the 100 acres as dry land and after it was irrigated is given below (and a simple budget is given in the column at left).

Increase in Profit

In the simple budget set out it is possible to trace the rise in actual profit due to only a slight rise in fixed charges and a much higher gross return. Of course the operating costs of the irrigation plant vary from year to year. However, a fair average running time of 750 hours has been allowed.

The basis of the budget has been two 100-acre farms, one irrigated and the other non-irrigated. The income and expenditure figures of the latter are based on the returns obtained from the 200-acre unit before irrigation was introduced on it.

Because of the increased work with irrigation it has been necessary to employ labour and this is shown by the increased charge against "wages".

Though it might be thought that the increase of 1.9 per cent in the profit on invested capital as a result of irrigation is not unduly high, it must be remembered that the value of the land has been increased by 50 per cent as a result of the marked pasture improvement brought about by irrigation. If the irrigated farm were given the same valuation per acre as the non-irrigated farm, the percentage of profit would be considerably increased. A return of 12.5 per cent after allowing owner's wages is good and particularly so when it is obtained from sand country where dividends as high as these were at one time considered to be impossible.

VALUATION OF FARM OF 100 ACRES

As dry land	£	As an irrigated farm	£
Buildings ..	3,300	Buildings ..	3,375*
Land (at £50 per acre) ..	5,000	Land (at £75 per acre)	7,500
		Irrigation plant ..	1,000
	£8,300		£11,875

* It was necessary to increase the value of buildings by £75 because of the added accommodation for the extra pigs carried.

(It has been necessary to raise the farm value since the use of irrigation because of the better pastures and increased soil humus.)

Stock and Implements—

	£		£
55 cows and replacements	2,600	67 cows and replacements	3,180
Implements, etc.	1,000	Implements, etc.	1,000
	£3,600		£4,180

Income—

Dry land (100 acres)	£	Irrigation (100 acres)	£
Butterfat—150 lb. per acre ..	2,250	218 lb. per acre (average) ..	3,280
Bobby calves—45 at £2 each	90	54 at £2 each	108
Cull cows 8 at £12 each ..	96	11 at £12 each	132
Pig meat at 7d. a pound of butterfat	438		635
	£2,874		£4,155

Expenditure—

	100 acres of dry land £	100 acres, of which one-third is irrigated £
Wages—		
Owner	670	670
Employee	—	262
Manure and cartage	174	238
*Grazing, and hay bought		133
Seed	15	30
General expenses for shed	33	40
Farm stores and veterinary expenses ..	36	43
Herd testing	36	44
Stock purchases ..	30	30
Tractor fuel and oil	67	67
Irrigation plant running		50
Baling charges ..	80	80
Insurance, banking, legal, etc.	42	42
Unforeseen at 1 per cent of income ..	27	43
Repairs and maintenance	199	233
Depreciation	177	254
Travelling	24	24
	1,610	2,283
†Surplus	1,264	1,872
	£2,874	£4,155
Interest on capital ..	10.6 per cent	12.5 per cent

* Young stock are grazed out. By doing this Mr Evans carries more cows, and the production from these more than offsets the grazing charges for the young stock. Mr Evans also buys in hay when he can do this favourably.

† This is the amount available to meet any mortgage interest charges and taxation and from which the owner can make any reinvestments in the enterprise.

High Incentive Payments to U.S. Sheep Farmers for Wool

THE sheep industry of the United States of America has been languishing for some years and various expedients, including high protective duties on wool, have been adopted to encourage its expansion.

The National Wool Act, passed in 1954, authorised the institution of a wool incentive programme for 4 years ending on 31 March 1959. Under it the price is supported at a level considered adequate to encourage the annual production of 300 million pounds of wool. The top incentive level is set at 110 per cent of parity, and the cumulative payments under the programme are limited to an amount equal to 70 per cent of the duties collected on imports of wool and wool manufactures beginning in January 1953. (Parity signifies a price which will enable a farmer to buy the manufactured commodities he normally requires for the equivalent of the same quantity of farm produce as would have bought them in a specified period in the past (1910-14).

For the 1955 marketing year the 62 cents per lb. incentive payment was 106 per cent of the September 1954 parity, when the level was set. This 62-cent level has been continued for the 3 succeeding years of the programme and was 106 per cent of parity for the 1956 marketing year; 101 per cent of parity for the 1957 marketing year; and 95 per cent of parity for the 1958 marketing year.

For the 1957 marketing year wool payments under the incentive programme will amount to 15½ per cent of the producers' cash return from the sale of wool. Small deductions will be made for charges incurred in advertising and trade promotion.

Payments under the first 2 years of the wool incentive programme total over $109,000,000, or nearly £39,000,000. It is interesting to note that the total funds in the New Zealand wool reserve account amounted to £30,000,000 at 30 June 1958. When it is remembered that wool production in America is only about three-fifths of that in New Zealand the extent to which the American producer is dependent on assistance from the Federal Government is made clear.

Care of Livestock during October

Contributed by the Animal Research Division

BLOWFLY STRIKE IN EWES

IN districts where crutch strike causes trouble in ewes crutching or early shearing is advised. Close supervision is necessary to detect cases so that suitable treatment can be applied before the strike becomes too extensive. When treating cases of fly strike, shear the soiled wool away from the immediate vicinity of the strike. Dressings containing aldrin, dieldrin, or BHC will rapidly kill the maggots, which will be expelled from the wound. In addition treatment with either aldrin or dieldrin preparations will prevent re-strike until dipping if this is done in January. These dressings do not prevent the flies blowing the sheep with eggs, but they do prevent the maggots from hatching and causing a strike.

Irritant fluids such as kerosene should not be used; they may kill the maggots, but they will irritate the wound and tend to cause re-strike.

Jetting ewes is not usually necessary, but if fly strike is severe, it may be advisable to treat them to give protection until dipping. Apply ½ gallon of aldrin or dieldrin wash to the crutch of each animal, extending the wetted area to above and round the tail. A pump working at 40 lb. to 60 lb. pressure per square inch, with a hand cut-out on the nozzle, is advisable for this purpose. Jetting with aldrin or dieldrin at 0.05 per cent strength will give 2 months' complete protection against crutch strike; for longer protection 0.1 per cent should be used.

CATTLE TICK CONTROL

Where cattle ticks are plentiful spraying or dipping should be done in November and December to prevent tick worry and to kill the adult female ticks before they lay their eggs.

BLACK DISEASE VACCINATION

In the east coast areas of the North Island, where black disease of sheep occurs, vaccination should be done during November or early December. This will protect against the disease, which occurs mainly in summer and autumn. Vaccine should be ordered immediately.

BLOOD POISONING AFTER SHEARING

Deaths in sheep after shearing may be due to infection of cuts or bruises with the blackleg germ. This disease can be prevented by vaccinating at least 3 weeks before shearing. Sheep which have been vaccinated previously may not require revaccination, and a veterinarian or Livestock Instructor should be consulted about the best procedure.

BLACKHEAD IN POULTRY

Blackhead disease affects young turkeys and poultry and it can best be prevented by rearing these on land which has not been contaminated by adult poultry. If an outbreak occurs, kill all affected birds and move the remainder to clean ground. In the event of a bad outbreak the local Poultry Instructor should be consulted, as in some cases treatment may prove beneficial.

MATING OF DAIRY COWS

Before each cow is mated two heat periods or an interval of at least 30 days should be allowed after calving. Cows mated before this period are less likely to get in calf, and the chances of contaminating the bull are increased. Hand-mating should be practised and accurate records kept showing the bull used and the dates of all services. Should breeding trouble occur these records will be of considerable assistance in arriving at a correct diagnosis.

ROUNDWORMS IN POULTRY

Infestation by roundworms is one of the most important causes of poor development of young birds. All growing stock should be treated twice with carbon tetrachloride, once at 3 months old and again at 5 months old.

SUPPLEMENTARY FEED

Supplementary feed is essential to ensure the proper feeding of cows in winter and in dry summers and to control facial eczema in autumn. As soon as more pasture is available than is necessary to meet the immediate needs of stock the balance should be shut up for silage or hay. On a well managed dairy farm it should be possible to shut up at least 40 per cent of the pasture.

Crop growing for fattening of weaned lambs is standard practice in South Island districts and it could with advantage be adopted more widely in North Island districts which experience a dry summer. Crops such as thousand-headed kale, chou moellier, and turnips, in addition to providing excellent fattening feed for lambs, are a splendid insurance against facial eczema. In Poverty Bay and Hawke's Bay they should be sown before the end of October so that they can be well established before dry weather sets in.

GREENLEG IN BROODER CHICKENS

Greenleg occurs in poorly ventilated brooders, especially if they are overcrowded and damp. At the first sign of trouble ensure that ventilation is adequate and that the litter is changed if it is at all damp.

COCCIDIOSIS IN CALVES

Scouring in calves under 6 months of age is seldom due to worms; it is much more likely to be caused by coccidiosis, especially if blood is present in the droppings. Effective drugs are available for treatment, but these can be obtained only on the prescription of a veterinary surgeon, who should be consulted.

Crop and Pasture Management

Seasonal Notes by the Extension Division

SELECTIVE weedkillers now available have proved very valuable for the elimination of seedlings of many weeds in cereal crops. The time of spraying as pointed out in these notes is important.

WEED CONTROL IN CEREALS

THE new season's crop of weeds will make its appearance in autumn-sown cereal crops toward the end of August. Under favourable weather conditions, a harrowing at that time will achieve a fair degree of control. More effective control can be obtained by spraying with hormone weedkillers.

Provided the weeds are young when sprayed, this treatment is effective against most annual weeds that may otherwise substantially reduce yields. Reasonable control of Californian thistle can also be obtained. Weeds such as wild turnip, tares, hedge mustard, fat-hen, and shepherd's purse are commonly troublesome unless sprayed.

Best results are obtained with the salts of MCPA or amines of 2,4-D applied at 1 lb. acid equivalent per acre. It is inadvisable to use the esters of 2,4-D, which, though effective against weeds, are more likely to cause crop damage.

The correct time to spray is just after crop plants have completed tillering and are about 6 to 8 in. high. Earlier spraying is liable to affect adversely tillering and subsequent crop yield. Late spraying reduces germination of the grain, an important feature with all seed crops and malting barley.

The application of sprays as soon as the crops have been fed off ensures that weeds are not unduly sheltered from treatment. If it is found necessary to spray a crop undersown with clovers, 2,4-DB at 1 lb. acid equivalent per acre should be applied after the clover has formed its true leaves.

—*A. J. EBERT*

* * *

LATE CLOSING FOR GOOD HAY

MOST hay is made from the surplus spring flush of pasture growth. This surplus growth from mixed grass and clover pastures is generally dominated by grasses which should be cut in the early flowering stage for good hay, but the weather is seldom right for this to be done. The hay is either coarse and stemmy, low in feeding value, and unpalatable through waiting for fine weather, or if it is cut early, it is too often spoilt by rain. In either case the hay is fit only for the maintenance of mature dry stock. There is a growing need for much higher quality hay on most farms for the better feeding of young stock (calves and hoggets), for feeding to ewes should they have to be kept off pastures because of facial eczema when they should be on flushing feed before tupping, and for feeding to cows in milk when other suitable feed is not available.

High-quality, nutritious, and attractive hay from mixed grass and clover pastures has been obtained by farmers in many districts in the following way. Though the main flush of grass growth has to be taken care of by the usual methods of grazing management, silage making, topping, and some early haymaking, good hay is provided by late closing of selected paddocks after the main flush of grass growth is over. This means a delay of some weeks or so during which the grass growth is well controlled by grazing and topping, the aim being to catch and make use of the clover flush for the hay. This material is high in feed value and low in fibre and makes attractive, nutritious hay which can generally be harvested under good weather conditions. Hay quality is not affected by delays in cutting that may be caused by unsuitable weather, because the clover that forms the bulk of the hay does not deteriorate as grasses do by becoming stemmy and too fibrous. Crops are not usually as heavy as earlier cuts, but make up for this in quality. This method of making good hay has much to commend it.

—*C. J. HAMBLYN*

* * *

SPRING PASTURE MANAGEMENT ON DAIRY FARMS

DURING September there is often an embarrassing gap in the supply of feed after winter reserves are finished and before pasture growth makes sufficient headway to provide a full supply for the herd. This gap is often extended by farmers who stop using the electric fence as soon as the autumn-saved pasture has been rationed out. Allowing the herd to range over several paddocks shortens the recovery interval with the result that there is an insufficient period to obtain maximum growth. It is better to eke out the feed on a smaller area of pasture with silage and hay or, if feed is really short, with concentrates.

Close, continuous grazing in early spring favours clover growth at the expense of ryegrass. Dairy farmers are often worried by pastures that contain too much clover. This is accentuated by early close grazing followed by lax grazing when the clover is growing vigorously. The use of electric fences until growth is well away will help to overcome this.

It is wiser to close for hay and silage paddocks which were wintered on rather than those which were closed for saved grass, and it may also pay to oversow those which were pugged badly. In districts which dry out badly in summer the oversowing of ryegrass may not be worth while, but oversowing about 5 lb. of red clover per acre could make a tremendous difference to both the quality and quantity of hay cut from such a paddock and to the speed of its recovery.

—*S. D. CLAY*

* * *

LUCERNE SEED INOCULANTS

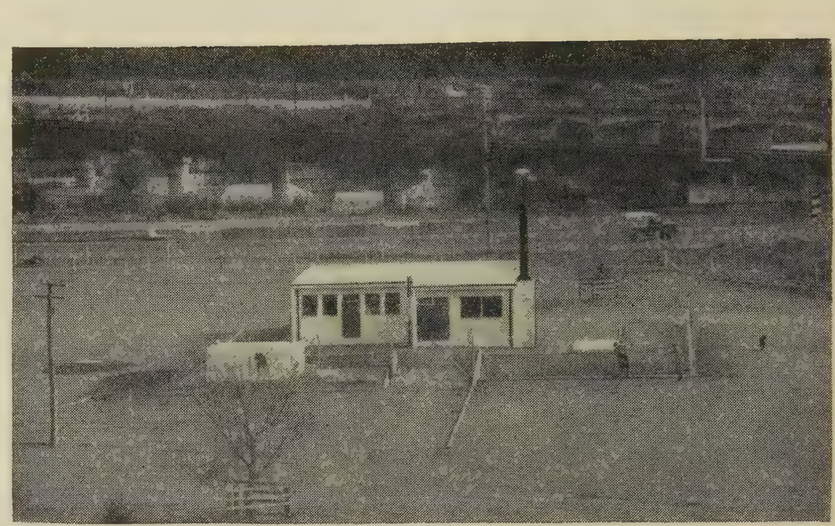
AT present a number of certified inoculants are available both with agar as a base (dispensed by mixing the agar with skim milk and then adding the mixture to the seed) and in powder form (humus or peat; dispensed by mixing with water, skim milk, or some syrupy fluid and then applying to the seed). These cultures are tested for the presence of satisfactory and viable organisms by the Plant Diseases Division of the Department of Scientific and Industrial Research. Efficient use of inoculants depends on ensuring satisfactory adherence to the seed, and water has not proved a reliable agent for this. Syrupy stickers are recommended for use with dry powder inoculants.

Bacteria can be killed by direct contact with acid fertilisers and the general recommendation is to use equal parts of reverted fertilisers and lime when sowing inoculated seed and manure together. Seed and fertilisers should not be held long after mixing. Final success with cultures is dependent on strict adherence to manufacturer's instructions and the application of normal principles of good farm management.

—*W. R. LOBB*

New Wallaceville Quarantine Out-Station

WITH the completion of the Silverstream Quarantine Unit for Infectious Diseases, an out-station of the Department of Agriculture's Wallaceville Animal Research Station, research work on highly infectious diseases of animals can be carried out with absolute safety and with no fear of spread to other stock. New Zealand is remarkably free of the major highly infectious diseases of livestock such as foot and mouth disease, Newcastle disease, rinderpest, rabies, and swine fever, but danger of their introduction is ever present and it is essential that they should be recognised at their point of entry and their presence confirmed by laboratory transmission tests in strict isolation.



SITUATED in a double-fenced area near the eastern entrance of the Taita Gorge, the Quarantine Unit is bounded by the Taita-Silverstream main highway and the Upper Hutt railway line. It has the advantages of isolation from the Wallaceville Research Station and other farm properties, and is yet convenient enough to Wallaceville to be worked by research staff from that Station.

The laboratory was designed by research staff at the Wallaceville Station and was built by a private contractor to drawings and specifications drawn up by the Wellington District Architect, Ministry of Works.

Testing for Virus of Blue Tongue

The unit is already being used for the testing of cattle imported from the U.S.A. to ensure that they are not carrying the virus of blue tongue, the disease that was primarily the reason for Australia's applying a total ban recently on the importation of sheep and cattle. Blue tongue is essentially a disease of sheep, but cattle have been shown to carry the virus though showing no clinical symptoms of the disease themselves. No further importations into New Zealand of cattle from North America are to be permitted.

Blood samples taken from the cattle recently imported from the U.S.A. have been inoculated into sheep at the unit and the temperatures of the sheep will be taken twice daily. If there are no responses, a second group of sheep will be inoculated with blood from the first group, and thence to a third group before it can be established that the virus is not present in the blood of the test animals, and therefore in the imported cattle. Only one transmission should be necessary for diagnosis of most diseases.

Blue tongue disease is transmitted in countries where the disease occurs by a very fine midge (culicoides). This insect has not been reported in New Zealand, but as an extension of the inoculation work at the unit and in an attempt to find whether the midge is present in New Zealand, special insect traps will be set up by Wallaceville workers at several likely points near bodies of water throughout the country in the summer.

The Department of Agriculture's booklet "Diagnostic Procedure for Dangerous Exotic Diseases of Animals", which has been supplied to all veterinary surgeons and Livestock Instructors, describes the diseases which could be introduced and the type of material required for diagnosis. It stresses the danger of spreading infected material from farms or premises on which a highly infectious disease is suspected and from which no specimens can be forwarded without the permission of the Director of the Animal Industry Division of the Department of Agriculture. If such a disease is suspected it should be reported to the Livestock Superintendent of the district and his instructions awaited before material is forwarded as prescribed in the booklet.

When this procedure is followed the Diagnostic Section at Wallaceville will be warned of the arrival of the material and arrangements will be made to deal with it at the new unit. Experimental animals for inoculation and their full feed requirements will be placed in the unit and the double doors locked, all other animals being removed from the double-fenced area.

Elaborate Precautions for Isolation

Once suspected infected material enters the unit for diagnosis and inoculation work, elaborate precautions for complete isolation of materials, animals, workers, and feeding stuffs within the laboratory come into operation.

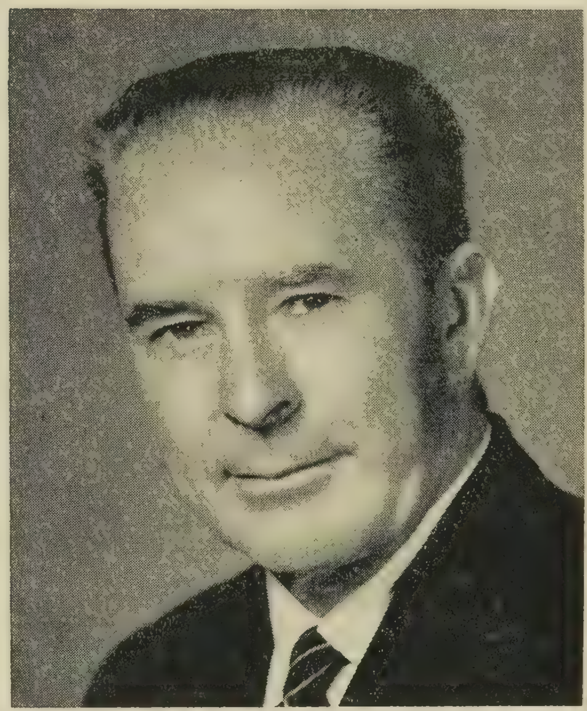
Workers enter the unit by a compartment separated from the working area of the building by a shower and foot bath. All clothing is removed, the shower and foot bath are passed through, and special protective clothing and boots are put on. On leaving the building workers go through the same procedure in reverse.

All animals that die or are killed in the unit will be subjected to post-mortem examination and any other examination considered necessary to arrive at a correct diagnosis. All animal material will be destroyed in an oil-burning incinerator within the building. All washings from the floors are carried by drains to treatment and sterilising tanks where they are held until they are no longer infective.

The new unit not only provides the long-needed special facilities required for work on highly infectious animal diseases; it represents another bastion for the protection of the country's valuable livestock industry, and great credit is due to the research workers responsible for its design and completion.

Agricultural Discussions with United Kingdom Government

By C. F. SKINNER, Minister of Agriculture



Mr C. F. Skinner.

EARLIER this year I visited the United Kingdom to discuss the marketing of our dairy produce and meat.

This visit was made in accordance with Articles 1 and 2 of the 1957 agreement between New Zealand and the United Kingdom, which supplemented the Ottawa Agreement of 1932. Under the 1957 agreement the two Governments each undertook to give full weight to the views of the other in the formulation of their production, marketing, and import policies relating to agriculture. To this end provision was made for consultations in November each year and at any other time at the request of either Government.

Though the first of the annual consultations under the agreement had taken place only the previous November, the marketing of our dairy produce and meat in the United Kingdom deteriorated so rapidly in December and the first 3 months of this year that it became absolutely essential that we ask the United Kingdom for urgent consultations. In November 1957 our butter was realising 260s. per hundredweight on the London market. By March of this year the price had fallen to 230s. per hundredweight, and in April there was a further fall to the catastrophic low level which prevailed until toward the end of June—206s. per hundredweight. In addition, lamb prices over the same period fell by about 25 per cent and there were also serious declines in returns for the by-products of the meat industry.

Agriculture in New Zealand's Economy

THE extent to which the New Zealand economy depends on the successful marketing overseas of our three main export commodities, dairy produce, meat, and wool, is perhaps not sufficiently realised. This dependence is well illustrated by a few basic statistics. In 1957 our total exports, which were valued at £276.1 million, included exports of dairy produce £66.1 million; of meat £70.5 million; and of wool £105.7 million. That is, of our total exports dairy produce contributed about 24 per cent, meat 26 per cent, and wool 38 per cent. Of the remainder, livestock by-products contributed a further 5 per cent.

New Zealand's entire economy is based on the sale overseas of the farm products just mentioned, because it is from the proceeds of these exports that we pay for the capital goods and raw materials which are essential to our manufacturing industries and for those consumer goods not produced locally. As our population grows, more and more of our people are required to find employment in manufacturing, and our ability to maintain full employment is, therefore, vitally dependent on satisfactory markets for our dairy produce, meat, and wool.

Toward the end of 1957 and during the first quarter of 1958 wool prices also dropped and just before my departure for the United Kingdom the prices were nearly 15d. per pound lower than the average prices of 1957.

The significance of price falls is well illustrated by the fact that a 10s. per hundredweight reduction in the return for butter means a loss in overseas earnings of about £1.5 million; and each 1d. per pound on wool for a whole season represents about £2 million to New Zealand. A penny per pound on a whole season's lamb production also represents nearly £2 million in overseas exchange.

The drop in prices for our principal export commodities was not accompanied by a corresponding movement in the prices of imported goods. Terms of trade (the purchasing power of our exports in terms of imported goods) therefore moved against New Zealand. This movement was a continuation of a trend which had shown itself in official statistics for the fourth quarter of 1956 and which gained momentum in the third quarter of 1957. The

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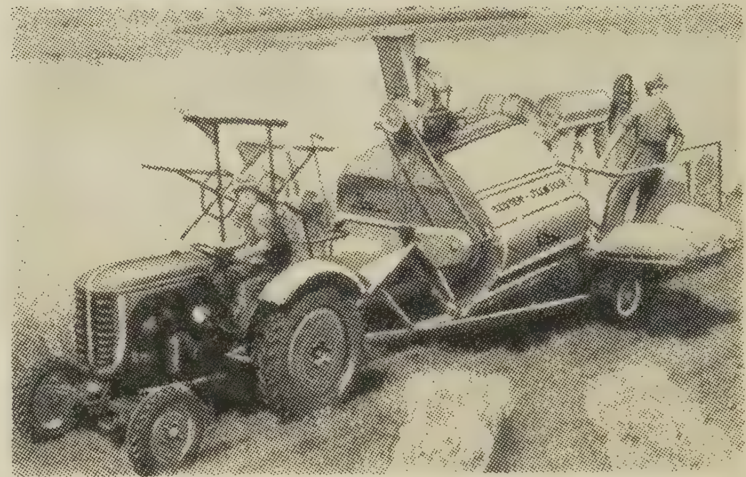

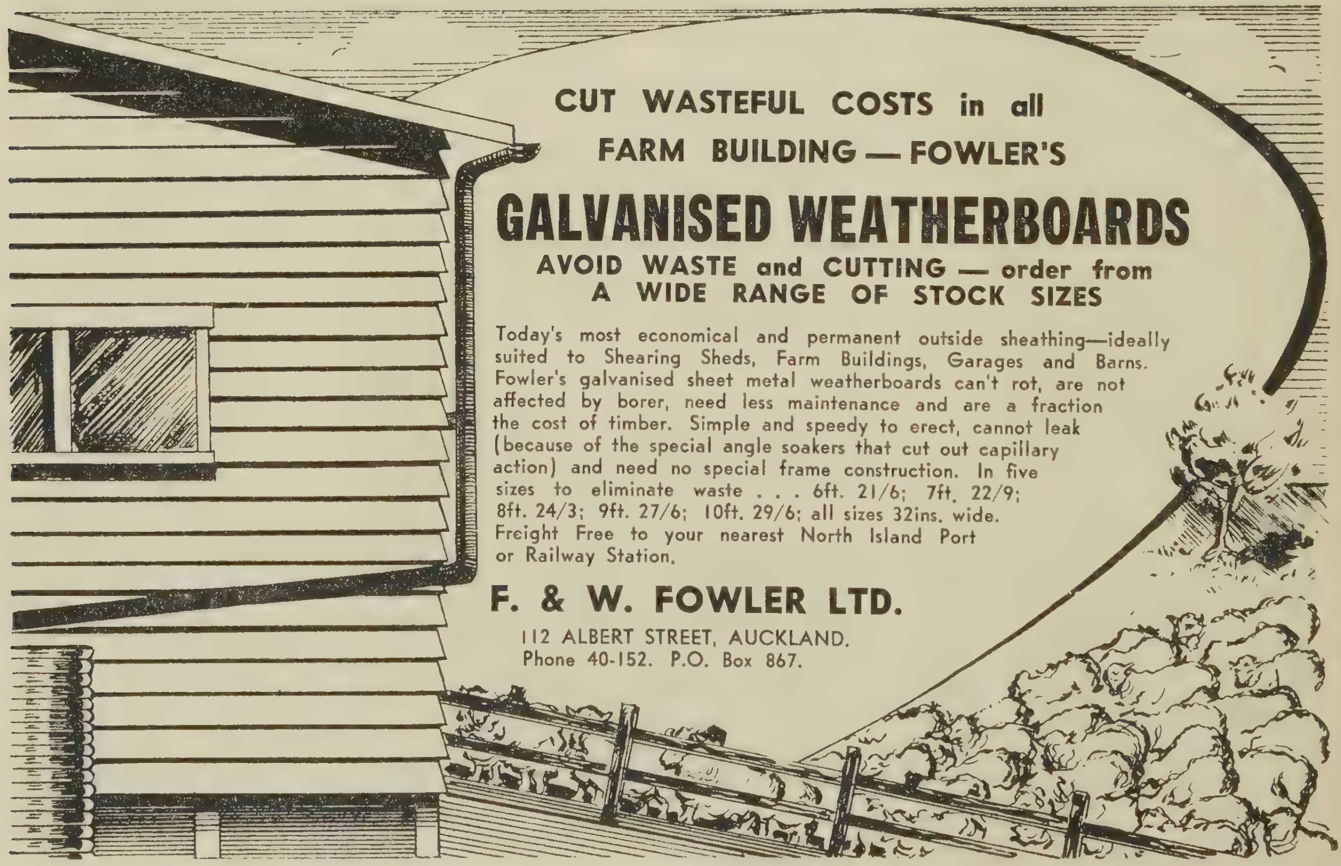

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downward trend had its reflection in New Zealand's balance of overseas receipts and payments, which showed a deficit of over £32 million for 1957.

United Kingdom Market

The United Kingdom normally purchases about 90 per cent of our butter, 96 per cent of our cheese, 80 per cent of our meat, and nearly 40 per cent of our wool. My representations to the United Kingdom Government related principally to dairy products, for very good reasons. Firstly, price falls of dairy products had been most drastic, and it was our dairy farmers principally who were being most adversely affected. Secondly, wool as a basic industrial raw material commanded a world market, and the United Kingdom, though the principal purchaser of our product, could not materially influence world prices. Thirdly, the fall in the price of lamb was to some extent counterbalanced by the buoyant demand for beef, particularly in the United States, with a corresponding beneficial effect on beef prices.

Before I refer to the nature of my representations to the United Kingdom Government and the outcome of the discussions, it is desirable to give a picture of the present world market situation for dairy products in general.

Liquid Milk

During the past few years there has been a steady increase in world milk production. Based on figures for 18 of the principal producing countries, this increase in 1957 was about 2 per cent. The most pronounced expansion has taken place in Europe, particularly in the United Kingdom. This increase in milk production has resulted largely from improvements in breeding and feeding, which have been reflected in higher average milk yields per cow. However, in some areas, particularly in the U.S.S.R. and eastern Europe, cow numbers have been increasing.

While milk production has been increasing the consumption of liquid milk has fallen, except in Canada and the U.S.A. Liquid milk usage in 1957 by the 18 countries referred to above increased by less than 1 per cent and for the second consecutive year failed to keep pace with population increase. The bulk of the increase in milk output has therefore been used for manufacturing, particularly in making butter.

Butter

According to the Food and Agriculture Organization, 23 of the world's leading producers of butter had an output of over 3½ million tons in 1957 compared with about 3 million tons in 1954, an increase of 15 per cent. The areas which have contributed mainly to this increase have been Europe and the U.S.S.R. Production in the four major exporting countries, New Zealand, Denmark, Australia, and the Netherlands, has been nearly static.

Apart from the fact that increased quantities of milk have been used for manufacturing, other factors which have made for greater supplies of butter are:

1. Increases in the average fat content of milk.

2. The practice in a number of countries of standardising the fat content of milk for liquid consumption below its natural level, thus releasing considerable quantities of butterfat for processing. It is estimated that as a result of this practice an additional 60,000 tons of butter was produced in western European countries alone in 1955-56.

World Demand for Butter

Between 1953 and 1956 butter consumption per capita increased appreciably only in one large importing country, the United Kingdom. In many countries consumption either fell or remained static. Though butter consumption in a few countries increased substantially in 1957 and the first part of 1958, the increases have not been general. On the other hand, consumption of margarine, an important competitive product, has been increasing.

The increase in world butter production without a corresponding increase in consumption has had a twofold effect:

1. There has been a greater concentration of supplies on the United Kingdom market, which takes about 75 per cent of the world's butter exports.

2. The "world" (United Kingdom) market price for butter declined steadily, despite several short-lived rises.

A comparison of the annual average London wholesale prices for New Zealand butter clearly illustrates the price trend.

	Per cwt. s.
1954	373
1955	355
1956	323
1957	285

Earlier this year the price declined to 206s. per hundredweight, but has since recovered to 235s.

The foregoing analysis of the world butter market shows that production over recent years tended to outrun demand and consequently prices dropped. Behind this very simple statement of the operation of one of the basic economic laws lie some very disturbing features which are disclosed only on close analysis of the factors influencing the supply of, and the demand for, butter.

Effects of Support Policies on Supply and Demand

During recent years the supply of agricultural commodities has been greatly stimulated by the almost universal adoption by countries of policies designed to support agricultural incomes and prices. The social and political background to such policies must be recognised if the situation is to be viewed realistically.

In most countries farms are small and farm incomes are lower than nonfarm incomes. Farmers constitute a large part of the population and of the total electorate. At the same time the very nature of farming justifies the adoption of measures to ensure to farmers a fair return for their efforts. Farming is subject to special risks arising from the vagaries of the weather, which play an important part in the success or failure of a crop and in the health and mortality of livestock. Again, agricultural production cannot be readily adjusted to changes in demand, and perishable products must be disposed of irrespective of the state of the market.

Though recognising the considerable merit in income and price support measures, this country, as an efficient producer of agricultural products for sale in world markets, takes the strongest exception to countries, particularly in Europe and North America, adopting unrealistically high levels of support for agriculture based on extensive use of subsidies. In some countries, not only is domestic production encouraged by subsidies, but consumption is discouraged by high domestic prices. The inevitable result is production surplus to requirements at the high supported domestic prices, restrictions on imports, and the disposal of surpluses abroad, often at dumped prices or on concessional terms.

The influence of national-income and price-support policies on the supply of and demand for butter is at the core of the problem facing our dairy industry today.

Among the farm products subject to price guarantee in the United Kingdom is milk. During recent years the surplus of liquid milk has been increasing under the stimulus of the price guarantee, and increasing quantities have been used in manufacture. In 1955 the United Kingdom produced 15,000 tons of butter. Production increased to 25,000 tons in 1956 and to 34,000 tons in 1957. For 1958 production is estimated at 44,000 tons. There have been similar large increases in the production of cheese and processed milk.

Not only has the United Kingdom's own production of butter been increas-

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ing, but she has accepted much larger exports from countries which have not been regular suppliers in recent years. For instance, in 1955 the United Kingdom imported 8,300 tons of butter from Finland, Sweden, the Irish Republic, and Argentina. Imports from the same countries in 1957 totalled 61,100 tons.

In the recent request made by New Zealand to the United Kingdom Government for the imposition of anti-dumping and/or countervailing duties on imports of foreign butter, the countries just mentioned were quoted as adopting unfair trading practices, and the following figures were given in support of this contention.

COMPARISON OF DOMESTIC AND EXPORT PRICES OF BUTTER EXPORTED TO THE UNITED KINGDOM IN 1957

	Exporter			
	Sweden (Dec.)	Finland (Nov.)	Irish Republic (Dec.)	Argentina (July)
	shillings per cwt.			
Sterling equivalent for domestic price	445	506	438.5	306
Export price	229	244	247	264
Amount by which domestic price exceeds export price	216	262	191.5	42

I have dealt rather fully with butter because it is our most important dairy product. Further, the effects of agricultural support policies on the market for butter is symptomatic of the effects of such policies on the market for other dairy products. I will, however, refer briefly to cheese and milk powder.

Cheese

Practically all of New Zealand's cheese exports go to the United Kingdom. The annual average price of cheese on that market during recent years has been as follows:

	Per cwt.
	s.
1954	191
1955	194
1956	278
1957	189

Today the price is 185s. per hundredweight. A factor which has materially contributed to the fall in price for cheese is the increase in the United Kingdom's own production, which rose from 63,000 tons in 1955 to 100,000 tons in 1956 and to 114,000 tons in 1957.

Milk Powder

New Zealand has useful markets in many countries for milk powders, but efforts to develop these markets are continually frustrated by the action taken by some countries to dispose of their surplus production on concessional terms. On the United Kingdom market, where the bulk of our exports are sold, prices showed little change in the first half of 1957, but later in the year, with home production at a high level and substantial imports, quotations showed a marked reduction.

Mission to United Kingdom

The basic purpose of my visit to the United Kingdom was to request the Government of that country to reconsider its agricultural import policy to give effect to the objective of the Ottawa Agreement, which is the expansion of trade between the United Kingdom and New Zealand to their mutual advantage. I also wished to bring to the attention of the United Kingdom Government the fact that the very great majority of European countries restricted imports of butter to their own high-priced domestic markets, though they were free to sell their surpluses on the United Kingdom market.

The outcome of my talks with representatives of the United Kingdom Government is in essence embodied in the decision on New Zealand's request that action be taken against countries dumping butter in the United Kingdom.

Frankly, the Government was disappointed that the United Kingdom did not accede to our request for the imposition of duties on the products of the offending countries. In our view we had an irrefutable case.

The United Kingdom Government deemed otherwise, though they found that exports of butter by Finland, Sweden, the Irish Republic, and Argentina had been promoted by subsidies. In the light of this decision the United Kingdom Government decided to ask the Governments of Finland and Sweden to eliminate the practices complained of, or to keep exports to the United Kingdom within agreed limits. If these countries are unwilling to take either course, the United Kingdom will impose countervailing duties.

The Irish Republic was asked by the United Kingdom to enter into consultations on a similar basis in accordance with the provisions of a trade agreement of 1938.

The decision in respect of Argentina was that since estimated imports from that source in 1958 were not expected to be large, no action would be taken meantime. However, if it later seems likely that imports will rise above a specified level, the United Kingdom will offer Argentina the same choice as that offered Sweden, Finland, and the Irish Republic.

Independently of this action, the United Kingdom is to limit imports of Polish butter, and the open licence for imports of butter from eastern Europe generally is being withdrawn.

In the course of the discussions I had in London and in the decisions taken, the United Kingdom Government conceded a number of important points. These were:

1. That there had been subsidisation of butter by the countries complained of.

2. That there had been material injury to the New Zealand dairy industry.

3. That the problem of over-production and under-consumption of butter was world-wide and was at the root of the present difficulties. In consequence, the British Government proposed to take the initiative in such international forums as the Food and Agriculture Organization, the General Agreement on Tariffs and Trade, and the Organization for European Economic Co-operation, to achieve international co-operation in dealing with this problem.

4. That they were prepared to impose quotas on butter from the offending countries.

5. That if dumping or subsidisation were proved against other countries, they would be prepared to take similar action to that already proposed.

6. That they were prepared to withdraw open general licences for imports of butter.

7. That the action to be taken would result in the retail price of butter on the United Kingdom market rising to 2s. 9d. to 3s. per pound by the latter part of this year. This would appear to be tacit admission that 2s. 9d. to 3s. per pound is a fair retail price for New Zealand butter in the United Kingdom at present.

8. That the position would be revised in 6 months.

The points just listed were important concessions to New Zealand on matters of principle. It is difficult to say, however, what their likely effects will be on butter supplies to the United Kingdom.

For the period May 1957 to April 1958 total imports of butter into the United Kingdom plus home production were about 421,000 tons. In the period May 1958 to April 1959 it is estimated that, taking into account the effect of the quotas, supplies could total about 433,000 tons. Without quotas supplies would possibly be 450,000 to 460,000 tons.

To forecast with any accuracy how supplies of this order will affect prices is impossible, but the recent rise in consumption in the United Kingdom and measures taken by Continental countries to boost consumption should

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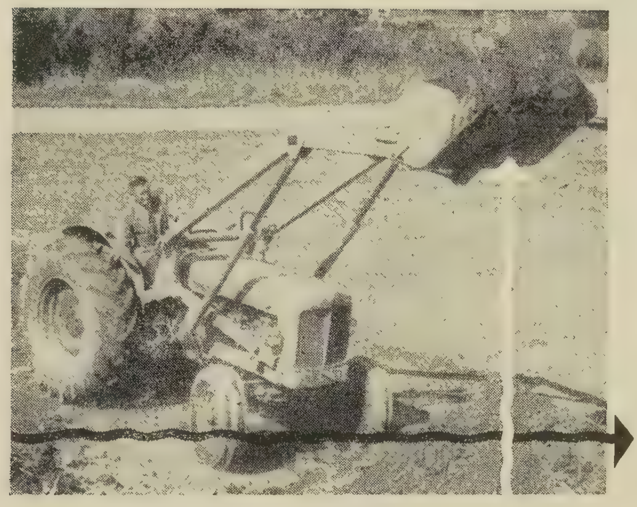

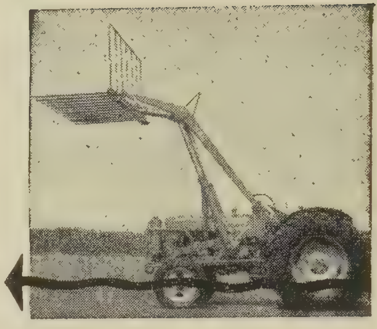

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help to firm the market. Butter consumption in the United Kingdom in April reached 8,500 tons a week. If such consumption were maintained, an annual offtake from the market of upward of 433,000 tons would be feasible.

Endeavours to increase the consumption of butter in Europe have been inspired by appreciation of the seriousness of the present market situation. In April last the International Federation of Agricultural Producers arranged a conference in London of representatives of butter-producing countries. This conference recommended to governments and marketing organisations that immediate steps be taken to:

1. Secure a significant increase in butter consumption in all producing countries by:

(a) Effectively narrowing the gap between prices of butter and margarine in countries where this is excessive; (b) extended publicity campaigns, or (c) other effective means.

2. Raise the fat content of milk sold for liquid consumption in countries where standardisation, especially at a low level, is now practised, to as near the natural level as possible and to take all possible steps to increase the consumption of liquid milk.

3. Promote the use of milk and milk products for welfare purposes; for instance, for school milk programmes.

The Organization for European Economic Co-operation has also held several meetings to consider remedial action, and individual governments and producer organisations are making efforts to deal with the problem.

Outlook

Market forecasting is extremely difficult. Nevertheless, the broad factors of demand and supply for milk and milk products would appear to indicate that at least in the short term the outlook is not very bright. The emergence during the past year or two of production surplus to requirements in certain European countries is an extension of a problem which has existed in the U.S.A. for some years. In that country support prices for agricultural products have so stimulated production above requirements that huge surpluses are held in stock and are disposed of by gift, loan, sale for local currencies, or on ordinary commercial terms. The U.S.A. exported about 24,000 tons of butter in 1954, 100,000 tons in 1955, and 80,000 tons in 1956. An average of only 6 per cent of these total shipments was disposed of on a commercial basis.

Disposals of agricultural products with a view to extending relief to the needy, raising living standards, or advancing the economic development of underdeveloped countries are justifiable and praiseworthy. Nonetheless, there can be no doubt that disposals from the highest motives do, in many cases, disrupt international markets to the detriment of countries such as New Zealand whose economies are highly dependent on the export of agricultural commodities.

At the heart of the whole problem is the intensification of national policies of agricultural protectionism. There is general recognition of the cause of the existing problem, but it would be closing one's eyes to realities to expect that radical changes in national agricultural support policies will be made quickly.

New Zealand takes every opportunity at international gatherings, and on other occasions where opportunity permits, of roundly condemning excessive protection for agriculture and of emphasising the serious implications for New Zealand and other countries which are highly dependent on trade in primary products. But it has to be recognised that the practices of which we complain are, in general, those of the powerful industrial countries of the world, which are sufficiently strong economically to give substantial support indefinitely to their agricultural industries.

Though the immediate outlook for the sale of dairy produce on world markets is far from cheerful, there are a number of encouraging factors. First of all we have the concessions of principle made by the United Kingdom following the Government's application on butter dumping. Then there is the specific action taken by the United Kingdom to limit the quantity of foreign butter placed on her market. Again, there are the recommendations of the International Federation of Agricultural Producers and the action taken or proposed by a number of countries.

Above all else, we can take heart in the fact that our farmers are highly efficient producers of foodstuffs in a world whose population is increasing at the colossal rate of 47 million a year. In other words, an additional market the size of the United Kingdom comes into being each year. Put another way, world population should double within the next few decades.

Unfortunately, the greater part of the additional population represents, at the most, potential consumers, because like a large proportion of the existing population, they will not have the means to buy our products. However, today international cooperative action is directed toward the economic development of the less advanced parts of the world. To an increasing extent, therefore, potential markets will become effective markets.

Meantime it is the task of our farming industry to maintain and improve the quality and attractiveness of its products, reduce costs wherever possible, and diversify production to the maximum extent practicable.

COMMONWEALTH ECONOMIC COMMITTEE

PUBLICATIONS listed below can be obtained from the Secretary, Commonwealth Economic Committee, 2 Queen Anne's Gate Buildings, Dartmouth Street, London, SW1, from H.M. Stationery Office, P.O. Box 569, London, SE1, or through any bookseller.

Meat, 1957

An annual volume in the Commodity Series of the Commonwealth Economic Committee, London. Reviews world production, consumption, trade, and prices for all types of meat, offals, and livestock and examines the measures of various Governments having a bearing thereon, such as marketing schemes, prices and subsidy arrangements, trade agreements, and import duties. Price 5s. 9d. including postage.

Dairy Produce, 1957

An annual volume in the Commodity Series of the Commonwealth Economic Committee, London. Reviews world production, consumption, trade, and prices for all kinds of dairy produce including milk, butter, cheese, condensed milk, milk powder, casein, eggs, egg products, and margarine. Examines the measures of various Governments having a bearing thereon and gives details of import duties in the main importing countries. Price 5s. 9d. including postage.

Fruit, 1957

An annual volume in the Commodity Series of the Commonwealth Economic Committee, London. Reviews world production and trade for fruit and deals individually with the main kinds of deciduous and citrus fruit, bananas, grapes, pineapples, canned fruits, dried fruit, fruit juices, and wine. Gives fruit consumption and utilisation figures for the United Kingdom and certain other countries, and information about tariffs, import quotas, licensing arrangements, import duties, and trade regulations of the United Kingdom and Western European countries. Price 5s. 9d. including postage.

Industrial Fibres, 1958

An annual volume in the Commodity Series of the Commonwealth Economic Committee, London. Reviews world production, trade, consumption, and prices for cotton, wool, mohair, silk, flax, jute (including substitutes and manufactures), coir, kapok, sisal, and other hemps, rayon, acetate, and other man-made fibres. Price 5s. 9d. including postage.

A Review of Commonwealth Raw Materials, vol. I (1958)

Volume 1 of this Report by the Committee to Commonwealth Governments reviews the Commonwealth situation against a world background for a wide range of raw materials (including metals and ores, non-metallic minerals, fibres, timber, wood pulp, rubber, and industrial vegetable oils) and for sources of energy. The course of production, consumption, trade, and prices is considered in detail and attention is drawn to some recent trends and developments. 288 pp. Price 16s. including postage.

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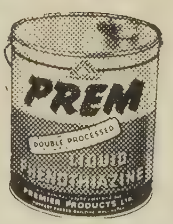

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MINISTER ANNOUNCES

Tuberculin Testing Scheme for Factory-supply Herds

THE hope that New Zealand herds would eventually be virtually free from tuberculosis was expressed by the Minister of Agriculture, Mr C. F. Skinner, in announcing details of the scheme for tuberculin testing of factory-supply herds. He said the proposals would avoid undue hardship to farmers in whose herds there was a high incidence of the disease.

If a herd contains over 10 per cent of reactors, the farmer may elect not to continue testing and may retain the reactors for up to 4 years to give him time to review his whole herd-management and replacement system. No further testing will be permitted, however, as long as reactors are retained. If, however, there are only 10 per cent of reactors or less, the owner agrees to dispose of all reactors before 1 September following the test and to continue with regular testing and disposal of reactors.

Devising a scheme which would be workable had not been easy, said the Minister. He wished to thank most sincerely the committee which had put such a great deal of time and thought into draughting the scheme. Those serving on or assisting the committee included members of the New Zealand Dairy Board, New Zealand Meat Producers Board, Federated Farmers, New Zealand Veterinary Services Council, New Zealand Veterinary Association, and Town Milk Producers' Federation and officers of the Department of Agriculture.

The following notice setting out details of the scheme will be issued to owners before veterinarians undertake testing.

ENTRY INTO THE SCHEME

Entry into this scheme is a voluntary arrangement between a dairy factory supplier and his Club or private veterinarian, but once an owner has agreed to join the scheme he accepts responsibility for carrying out the conditions of the scheme as set out in this summary.

THE SCHEME

The scheme provides for:

(a) Tuberculin testing of all cattle on the property over 14 days of age and includes animals on a permanent run-off used only for cattle from the main farm. (An owner sharing a run-off with another owner should seek the advice of his veterinarian on the advisability of testing in this case.)

(b) The immediate branding by the testing veterinarian of all infected animals.

(c) Slaughter of all Tb infected cattle, proceeds from the carcasses being paid to the owner by the works. The following special provisions relate to dairy cattle reactors which are 12 months of age and over at the date of the Tb tests:

  (i) Where an owner has 10 per cent or less dairy cattle reactors, such reactors must be slaughtered by 1 September following the date of the test and his herd will be subject to repetitive testing at intervals of not more than 1 year.

  (ii) Where an owner has more than 10 per cent dairy cattle reactors he may retain these reactors up to 4 years. If he elects to do this and does not dispose of these reactors by 1 September following the date of the test, his herd will not be subject to retesting until he re-applies for a Tb test after the last reactor on his property has been slaughtered.

  (iii) Where an owner has more than 10 per cent dairy cattle reactors and he decides to dispose of them by 1 September following the date of the Tb test, his herd will be subject to repetitive testing at intervals of not more than 1 year.

(d) Payment of compensation by Department of Agriculture to owners of slaughtered cattle which were not less than 12 months of age at date of condemnation, except that no compensation will be paid on condemned cattle which die before slaughter.

(e) A scheme for attestation of clean herds with recording of these herds in a Register of Attested Herds.

OWNER'S OBLIGATIONS

An owner's obligations are to:

(a) Apply to his veterinarian for testing services.

(b) Provide adequate facilities for testing all cattle.

(c) Pay his veterinarian's testing fees.

(d) Arrange for removal and slaughter of live condemned animals as instructed by the testing veterinarian or

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disposal as directed of clinicals or reactors dying or destroyed on the farm.

(e) Notify the Government Veterinarian or Livestock Instructor, Department of Agriculture, of the death of a condemned animal on the farm and comply with his directions as to the disposal of the carcass.

(f) Brand condemned stock with a temporary brand before consigning to works to assist Departmental meat inspection staff at works in identifying them.

(g) Notify, by letter or telegram, the Supervising Meat Inspector at the works to which condemned animals are to be sent.

(h) Notify the testing veterinarian, after all reactors have been removed, of all untested cattle brought into the herd within 7 days of their arrival on the property. Testing of replacements is to be by mutual agreement until one clear herd test is obtained, after which testing of replacements will be compulsory.

TEMPORARY BRANDING OF CONDEMNED STOCK

In addition to the permanent brand placed above the hock of each condemned animal by the testing veterinarian, the owner is to brand these animals temporarily just before sending them for slaughter by painting an arrow along the backbone and his initials on each rump. An enamelised paint is the most suitable for this purpose.

NOTIFICATION TO SUPERVISING MEAT INSPECTOR OF STOCK SENT FOR SLAUGHTER

The Supervising Meat Inspector at the works must receive a notification from the owner before the condemned stock arrive at the works for slaughter. Details to be set out in the notification are:

Full name and address of owner.
Number of clinical cases of Tb in the line.
Number of Tb reactors in the line.
Details of temporary brand placed on animals.
Date animals expected to arrive at freezing works.

NOTE: If the Meat Inspector does not receive this notification or the stock are not properly branded, he is unlikely to know that condemned stock are being killed for the particular owner and compensation cannot therefore be paid.

NOTIFICATION TO LOCAL VETERINARIAN, DEPARTMENT OF AGRICULTURE, OF STOCK SENT TO BOILING DOWN WORKS

Where clinicals are sent to a boiling down works not being part of a freezing works, details must be notified by the owner in a letter to the local Veterinarian, Department of Agriculture. The works sales or delivery docket, if available, should be sent with this letter. Details to be set out in the letter are:

Full name and address of owner.
Number of clinical cases of Tb sent to the works.
Details of temporary brand placed on animals.
Date stock sent to works.

DISPOSAL OF CONDEMNED STOCK

The disposal instructions issued to owners by the testing veterinarians will be according to the following formula:

(a) Condemned Cattle to be Slaughtered Immediately

(i) All clinical cases of Tb, i.e., animals condemned without testing them.

(ii) All reactors to the Tb test, except dairy cattle 12 months of age and over.

(b) Condemned Cattle to be Slaughtered by 1 September after the Date of Test

All reacting dairy cattle 12 months of age and over if the number does not exceed 10 per cent of the total dairy stock tested.

(c) Condemned Cattle Which May Be Retained up to 1 September following the Third Anniversary of the Date of the Test

All reacting dairy cattle 12 months of age and over if the number exceeds 10 per cent of the total dairy stock tested. No reactors may be held beyond this period.

COMPENSATION

Provided that the owner has advised the Supervising Meat Inspector before the stock are received at works for slaughter, and has properly branded his stock, compensation will be paid on condemned animals 12 months of age and over once they have been slaughtered. Payment will be made automatically by Department of Agriculture. Note that if stock which are required to be slaughtered by 1 September following the date of the test or by 1 September following the third anniversary of the date of the test are not so slaughtered, no compensation will be paid. No compensation will be paid on cattle which die before slaughter.

Type of condemnation	When slaughtered	Payment
Clinical	Immediately	£3 plus proceeds
Reactor	By 1 September following the date of the test	£8 plus proceeds
Reactor	By 1 September following the first anniversary of the date of the test	£6 plus proceeds
Reactor	By 1 September following the second anniversary of the date of the test	£4 plus proceeds
Reactor	By 1 September following the third anniversary of the date of the test	£2 plus proceeds

For further information about this scheme consult your veterinarian.

FUTURE TRENDS in New Zealand Agriculture

IN her range of export products New Zealand has permanent natural advantages that will surely prevail over the temporary expedients used to bolster uneconomic farming elsewhere, according to Mr P. W. Smallfield, Director-General of Agriculture, in a recent address to the South Canterbury Centennial Farm Conference. In reviewing likely trends in farming development, Mr Smallfield expressed confidence in New Zealand's ability to increase production economically. Best prospects for the future lay in preparation to meet expanding demand for animal products while meeting present difficulties by slackening emphasis on dairy production, expanding beef production, and trying to supply all domestic needs for cereals and seeds. Mr Smallfield's paper was as follows.

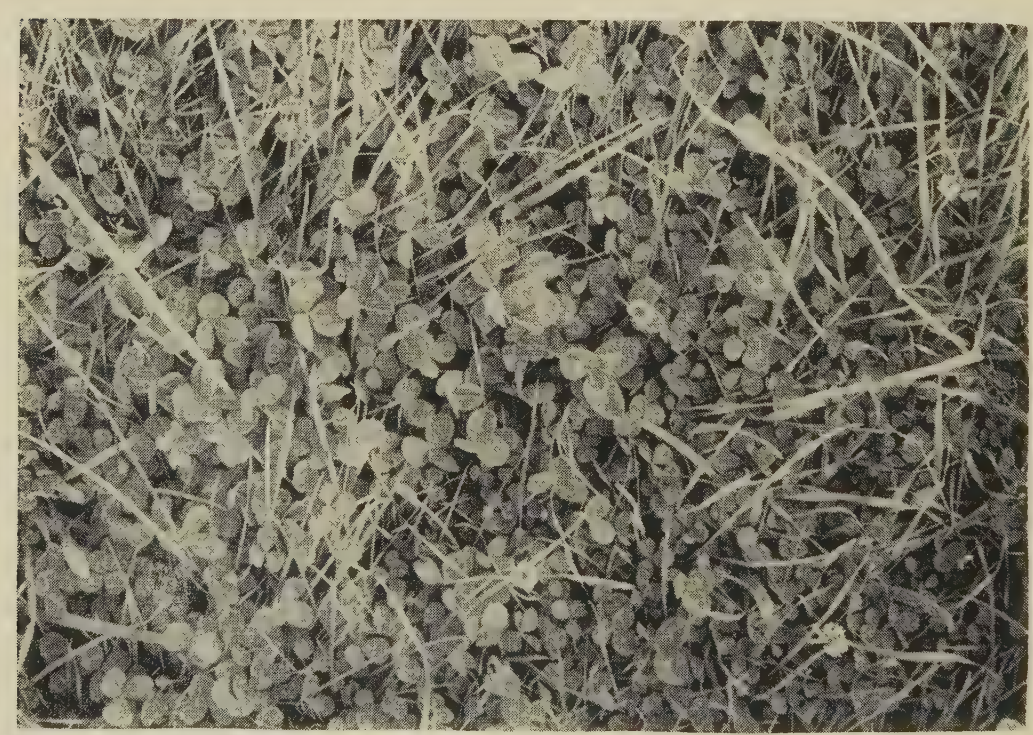
THE establishment in New Zealand of a pattern of grass farming for the production of animal products for export arose naturally from the market demand created in Europe by the industrial age and the advances in transport and food processing that enabled that market to be reached from the other side of the world.

The pattern followed has been based essentially on getting from the soil what it could produce most economically and this was the general trend wherever subsistence farming gave place to commercial farming.

In many industrial countries, however, domestic agriculture was protected by tariffs and their pattern of farming never completely conformed to the requirements of competitive trade. In supplying the free market in the United Kingdom New Zealand did conform to these requirements by selling products economically.

In developing our farming we have generally assumed an expanding market and at the moment it may seem that our problems are those of marketing and not of production. Over the years restrictive trade practices have increased; tariffs have been reinforced by quotas and subsidies, thus hindering the entry of our products to many markets and lowering prices.

Even in our current difficulties we should realise that in the range of our products for export nature has given us advantages that are **permanent** and time will surely mitigate the temporary expedients adopted to bolster uneconomic farming in industrial countries. Protection through subsidies, tariffs, and quotas is not likely to be eliminated; but the trend I think will be to reduce subsidies, which are particularly detrimental to our export sales, to the stage where marginal production is eliminated and the products are not so costly as to price themselves off their domestic market.



← A pasture established by the chemical pre-treatment method described by Mr Smallfield as probably the most remarkable agricultural technique discovered in recent years. The illustration shows part of a plot on an unploughable hillside that was treated with dalapon at 5 lb. per acre and sown with seed and fertiliser the same day.

Such a course would eliminate some of the problems of dumping.

Our future lies in grass farming and low-cost animal products. It is pertinent, therefore, to review likely trends in farm development to meet market requirements and the maintenance of a low cost of production.

Grass Farming

We pride ourselves that we are experts in grass farming, but looking back we must realise that it has taken us 100 years (plus the accumulated knowledge of centuries) to reach the present stage of satisfaction with our methods. In another 100 years our successors will have advanced their knowledge of the science and practice of grass farming far beyond anything we contemplate today. It may be useful therefore to review briefly the work we have done, contemplate our present position, and—greatly daring—anticipate changes which may take place on the basis of existing knowledge, bearing in mind always that we must sell our products. Selling in a competitive market means maintaining a low cost of production by efficient grass farming practices.

We initially adopted pastoral farming because it was the only thing we could do. We first exploited the natural tussock grasslands of the South Island and then started to convert our forest and fern lands to grass by burning and surface sowing. Up to the 1890's wool was our only important export farming product, and all that we had really learnt about pastures was that they deteriorated. Our tussock grasslands were beginning to deteriorate through burning, overstocking, and the depredations of rabbits; our surface-sown grasslands were also deteriorating and on ploughed land (except land of highest natural fertility) no one looked for permanent high-producing swards. Plough and renew was the accepted method of maintaining a productive sward.

There were some hopeful signs, there was new land to be brought in to meet the demands of the anticipated trade in frozen meat and, most important of all, phosphatic topdressing of pastures had started in a small way.

Era of Expansion (1890-1920)

The period 1890-1920 was one of remarkable progress in production, though it was essentially an era of expansion rather than one of higher farming. Our real advances were in the further development of topdressing and the adoption of balanced rotations in cereal farming districts. Our dairy and meat industries were firmly established and expansion in stock numbers was secured mainly through extending the pasture area on bush and fern lands after burning and surface sowing. These pastures deteriorated just as rapidly (and in many places even more rapidly) than did those sown in the previous period. We had, however, realised that over a large area of dairying land grass farming with permanent pastures based on a suitable grass: clover ratio was the key to economical production, and that on most dairying land the desired pastures could be secured only through topdressing.

We were still uncertain about the economics of all-grass farming in the higher-rainfall districts and generally accepted the idea that maximum economic production could be secured only by providing supplementary feed through root and green fodder crops in periods of low pasture production. We had not realised that high-producing pastures produced as much (or more) dry matter in a year as roots or green fodder crops and that, in addition to hay, pasture growth could be carried forward from one period to another either as green herbage or as silage.

Improvements in Farming Technique

From 1920 to the present our techniques of grass farming and consequent production have improved at a remarkable rate. Sowing of certified perennial ryegrass and white clover, topdressing and liming, and efficient pasture control and livestock management have become accepted practices. Further aerial topdressing and oversowing practices have recently opened the way for the improvement of millions of acres of hill country pasture land.

At present about 45 per cent of superphosphate used in New Zealand is spread by aircraft. The growth of the aerial topdressing industry is shown in Table 1.

TABLE 1—AERIAL TOPDRESSING

Year ended 31 March	Fertiliser spread (tons)	Area topdressed (acres)
1950	5,003	48,741
1951	44,957	428,737
1952	88,869	802,212
1953	144,802	1,376,118
1954	203,110	1,929,499
1955	279,006	2,783,802
1956	404,933	3,853,169
1957	428,245	3,945,586
1958	465,733	4,250,000*

* Estimated.

There are today 60 aerial topdressing operators and nearly 300 aircraft engaged in the industry with an estimated investment of £1.25 million.

In the North Island stock units per acre of sown grass and fodder crops rose from .31 in 1920 to .85 in 1957, and for the whole 42 million acres of occupied land in the Dominion (including 13¼ million acres of tussock grassland) they rose from .13 to .25.

Carrying Capacity

There is, however, a potential for even greater increases in carrying capacity in the next three decades. Of the 31 million acres under pasture in the Dominion, 13¼ million acres are unimproved tussock grassland, about 8 million acres are surface-sown grass, and 9¾ million acres are sown after cultivation. In the period 1920 to 1957 most of the increased carrying capacity occurred on the pasture land sown after cultivation.

New techniques for grassland improvement have opened great possibilities for the improvement of the surface-sown and tussock grasslands. Aerial topdressing and clover oversowing have been used to improve pastures over about half the surface-sown grassland area and also to improve limited areas of tussock grassland. Up to the present, though clovers have been introduced, it has not been possible, except on the easier slopes which can be cultivated, to introduce high-producing grasses such as cocksfoot, perennial ryegrass, and dogstail. Without these species the full effects of phosphatic topdressing are not obtained.

Now a new vista for improvement has been opened up by the use of chemicals for the destruction of the existing turf to prepare a seedbed for resowing with high-producing grasses and clovers. This is probably the most remarkable agricultural technique discovered in recent years.

Present practice is to use 5 lb. of dalapon per acre on browntop dominant swards (with the addition of 1 lb. of amitrol for control of annual clovers). The action of dalapon at 5 lb. per acre is slightly to check ryegrass, cocksfoot, and clovers while killing Yorkshire fog, browntop, and annual grasses. Dalapon (5 lb.) plus

TABLE 2—ASSESSED INCREASE IN LIVESTOCK NUMBERS

Types	Base year (1952) (thousands)	1962 (thousands)	Percentage increase	1972 (thousands)	Percentage increase	1982 (thousands)	Percentage increase
1. Dairy cows in milk	1,926	2,180	13	2,388	24	2,566	33
2. Beef breeding cows and heifers 2 years old and over ..	851	1,059	24	1,167	37	1,259	48
3. Other cattle	2,425	2,843	17	3,115	28	3,390	40
4. Total cattle (1+2+3)	5,202	6,082	17	6,670	28	7,215	39
5. Breeding ewes ..	22,963	29,466	28	33,386	45	37,482	63
6. Other sheep	12,421	15,502	25	17,242	39	18,881	52
7. Total sheep	35,384	44,968	27	50,628	43	56,363	59

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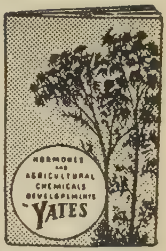
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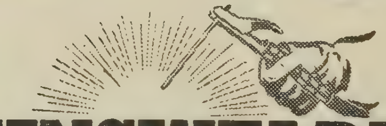

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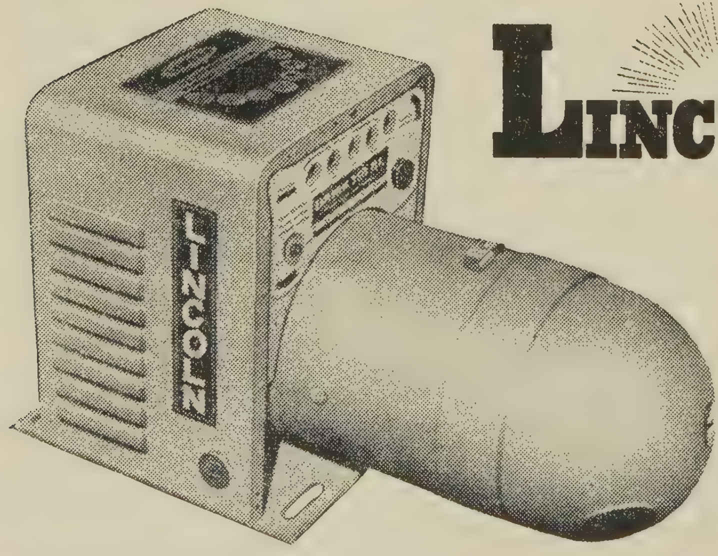

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amitrol (1 lb.) kills danthonia, chewings fescue, and annual clovers and severely checks perennial clovers. Grass and clover seed can be oversown the same day or up to a fortnight after application of the chemical.

Application costs of the chemicals are £2 10s. to £3 10s. for flat land and £3 15s. to £4 for hill country. An aeroplane or helicopter is capable of spraying, fertilising, and seeding an acre every 5 minutes at a total per acre cost of about £10. When the practice has been fully demonstrated it will allow the economic improvement of millions of acres of surface-sown hill country.

Tussock Country

The South Island tussock country also offers considerable scope for improvement. As a result of about 100 years of farming the vegetation of the South Island tussock country has reached a stage of near stability. In the low-rainfall areas the tussocks have been replaced largely by scabweed and bare ground, while in the higher-rainfall areas tussocks are surviving to a greater or less degree, but the inter-tussock spaces are filled with exotic grasses such as sweet vernal and Yorkshire fog. In the high-altitude snow tussock country much of the tussock has disappeared and screes have developed.

The aeroplane has provided the means for the improvement of a great deal of tussock country and practices now being adopted are:

1. The introduction of grasses and clovers in the low-rainfall areas.

2. The introduction of clovers in the high-rainfall areas.

The adoption of these practices after the control of rabbits has enabled very striking changes to be made on large areas of tussock country. The overall picture of the future development of tussock country is that it has a great potential for increased production.

Increasing Production

There is no doubt then about New Zealand's ability to increase production and produce economically. The necessity to increase production to match population and import needs has been stressed by the Department of Agriculture for a number of years. In 1955 the likely increases in livestock numbers for 10, 20, and 30 years on the base year 1952 were assessed (see Table 2).

The assessments were made by land classes (groups of soil types with similar potential carrying capacity) and represent field officers' estimates of likely trends in livestock numbers on each class. Likely production in terms of meat, wool, butter, and cheese was also calculated and was of course a little greater than the increase in livestock because of a projected improvement in output per animal. The rate of increase in production suggested was an average of 1.8 per cent per year or 1.4 per cent cumulatively. This is less than has been estimated in the past as the requirements for a population expanding at 2 per cent per year.

What has actually happened between 1952 and 1957 is shown in Table 3.

Dairy cow numbers are not keeping up with the forecast figure and reflect the difficulties of marketing. The main problem of dairy products is over-production due to extraordinarily high support prices for milk and other dairy products in Europe and North America. In fact it is due to underconsumption of butter, which is still at an absurdly high price in many European countries. Future prospects are not particularly good, for when one adds figures for consumption of butter and margarine together and considers the consumption of other fats as well the total fat intake in industrial countries is fairly high.

TABLE 3—INCREASE IN LIVESTOCK NUMBERS 1952-57

Types	1952 (thousands)	1957 (thousands)	Percentage increase
Cows in milk	1,926	1,998	3.7
Beef breeding cows and heifers	851	1,133	33.1
Other cattle	2,425	2,678	10.4
Total cattle (1+2+3)	5,202	5,809	11.7
Breeding ewes	22,963	28,899	25.9
Other sheep	12,421	13,483	8.6
Total sheep	35,384	42,382	19.8

Beef breeding cows already exceed the level forecast for 1962 and are nearly up to the 1972 figure. At present there is an acute shortage of beef, particularly in the United States of America, due to a combination of drought conditions (in the United States and Australia) and to the fact that beef cattle numbers are below average.

Neither of these conditions is likely to be permanent, but it looks as though the market prospects for beef in the United States are good for several years. Apart from that, there is an increasing interest in meat as a food throughout the world. Interest is being shown in many countries where incomes are low (for example Japan) and where the main interest is in meats of a type which can be made to go a long way and in which there is a minimum of waste; hence the demand for boneless beef.

Beef production has not been considered an economic proposition in this country except as an adjunct to sheep farming. In the past gross returns from beef have not compared favourably with those from mutton, lamb, and wool, but with present beef prices cattle numbers and beef exports should increase.

Breeding ewes are now nearly up to the figure forecast to be reached in 1962, but other sheep are lagging. We certainly face the prospects of having to secure additional markets for lamb. Future prospects for wool appear good, but wool prices have always proved sensitive to general economic conditions.

Market Prospects

In subsequent years market prospects, will undoubtedly influence production trends and livestock numbers, but we must in the main rely on meat, wool, and dairy products to provide our overseas funds. These are the only animal products we can produce economically.

Balance of payments difficulties have now focused attention on production for the domestic market, for we can save overseas exchange by local production of cereals and seeds.

Table 4 shows our average net imports of cereals and seeds between 1953 and 1956.

TABLE 4—AVERAGE NET QUANTITY OF CEREAL AND SEED IMPORTS 1953-56

	Bushels
Wheat	8,341,613
Oats	264,629
Maize	26,240
Barley	9,094
Seeds	15,818

There is obviously scope for the immediate expansion of wheat production in New Zealand and some expansion in other cereals and seeds (particularly cocksfoot, timothy, lucerne, and chou moellier) to make imports unnecessary. The extent to which we achieve this will depend on prices for lamb and wool and the demands for saving overseas exchange.

It is unfortunate that when research has paved the way for a rapid and economic expansion of primary production the future should be clouded by marketing difficulties. These I think are to a large extent temporary and we must be prepared to meet demand within the sphere of animal products. At the moment we are justified in slackening our emphasis on dairy production, expanding beef production, and endeavouring to supply all our domestic needs for cereals and seeds.

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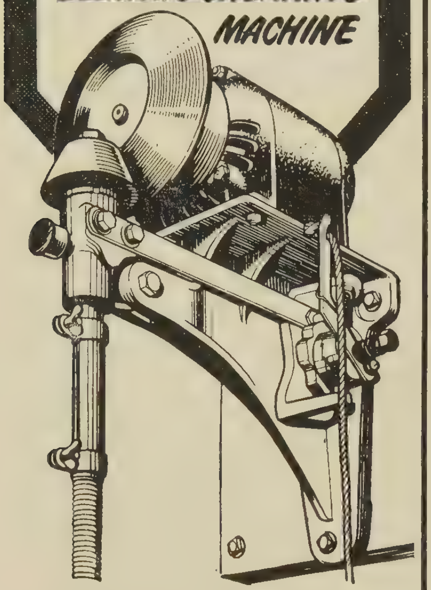

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An Efficient Bee Escape

By D. W. A. SEAL,
Apiary Instructor, Department of Agriculture, Invercargill

THIS article describes a bee escape used by many Canadian beekeepers and introduced to New Zealand by Mr G. Toogood, of Gore, who recently spent 2 years in Canada. Though some of the older beekeepers may remember bee escapes similar in design, the escape described here is simple to make and gives satisfactory service.

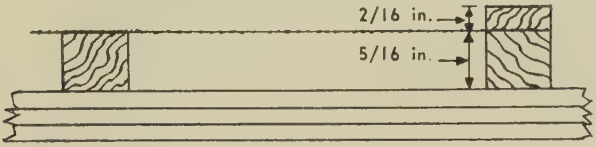
THROUGHOUT the years that bee culture has been practised bee escapes of varying designs have been used. Some of them have been patented and widely advertised and others have remained almost unknown.

Some beekeepers have long discarded their bee escapes owing to their being unsatisfactory, mainly because they became clogged too easily.

The advantages this design has over others are that there is little if any chance of clogging and that the escape can be made by any beekeeper fairly easily. Variations in construction may be considered an advantage, but if measurements from the drawing are followed, an efficient bee escape should result. Many such bee escapes have already been made in Southland and all reports of them are good.

Materials

The material required for each is a sheet of three-ply 19 in. x 15 in.; two 19 in. lengths of 1½ in. x ⅞ in. pinus, and two 16 in. lengths of 1½ in. x ⅞ in. pinus for the outer surround; about 5 ft. of 5/16 in. square pinus for cleats; a piece of wire gauze; straps of pinus ⅛ in. x 5/16 in. to fasten the outer edges of the gauze.



Cleats and wire on the plywood.

Construction

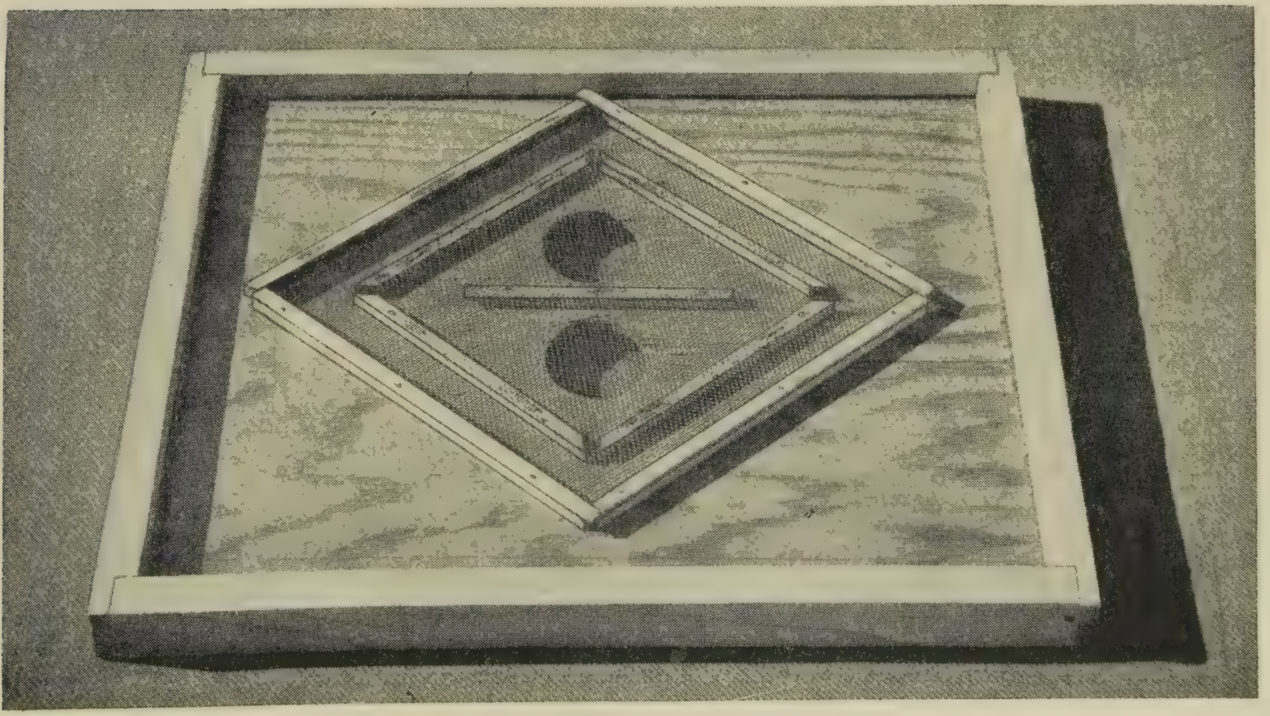
To make the bee escape first cut in the three-ply two holes 2½ in. in diameter with centres 3½ in. apart as shown in the illustration below. Next cut in the pinus being used for the outer surround a groove the width of the three-ply and 7/16 in. deep. The 5/16 in. square cleats can then be tacked into place on the plywood as shown in the illustrations. The gaps at the four corners of the inner cleats and outer cleats should be 5/16 in. The gauze is fastened by the ⅛ in. x 5/16 in. straps around the outer edges and fastened to the inner cleats with wire staples of the type normally used by stationers as paper fasteners. It is advisable to leave the fastening of the surround until last so that the plywood will be flat on the workbench while the cleats are being attached. A dip in paraffin wax will aid the lasting quality of the finished bee escape.

The escape is placed on the hive with the plain side with the two 2½ in. escape holes upward and the supers to be cleared of bees are stacked over it.

Bee escapes work best in late summer or autumn when nights are cold.

Experience by local beekeepers has shown that this escape will clear up to three supers of combs overnight provided no brood or the queen is placed above the escape.

▼ The assembled bee escape inverted, showing the construction. The escape holes are 2½ in. in diameter with centres 3½ in. apart on the centre line.



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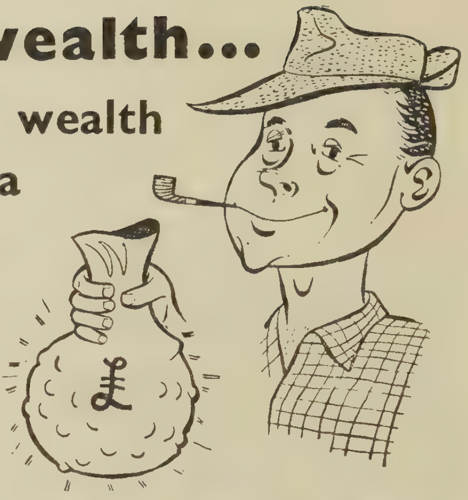

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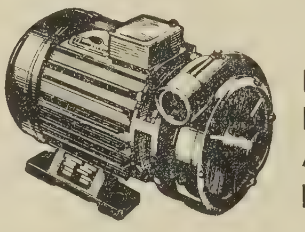

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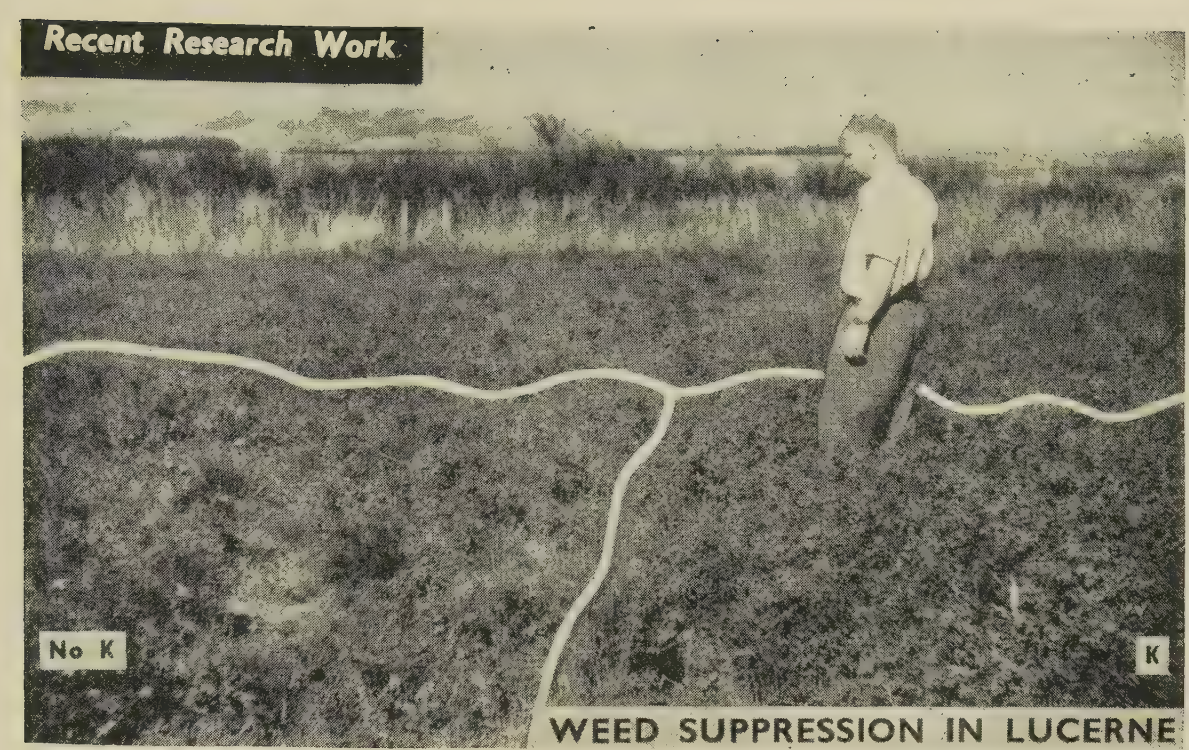

WEED SUPPRESSION IN LUCERNE

▲ The outstanding response to potash on lucerne in the right foreground compared with the no potash plot in the left foreground. Weeds, particularly grasses, have a strong hold in the unthrifty no potash plot.

TWO trials in Gore district have confirmed that weed control in lucerne must be considered from the viewpoint of correct fertiliser use to secure healthy and competitive stands as well as direct control with chemical weedkillers.

RATES PER ACRE

THE trials were laid down on unthrifty stands of lucerne in 1957, three rates being used of muriate of potash at 1, 2, and 3 cwt. per acre and two differing basal lime dressings, carbonate of lime and hydrated lime, each at 1 ton to the acre. In addition a basal dressing of 1½ cwt. per acre of superphosphate was applied to all plots.

CONDITION OF PLANTS BEFORE TREATMENT

Before treatment the lucerne plants were stunted, uneven in growth, and the leaves showed both a tip scorch and a fawn stippling round the margins of some leaves. The leaf colour was pale green.

GROWTH RESPONSE

Inspection in spring showed a growth response to all rates of potash modified by the type of lime applied as a basal dressing and varying with the rate of potash. All plots treated with potash showed a decrease in the stippling of leaf margins and the lucerne was a darker green. Treated plots were more even in growth than the controls. Responses to 3 cwt. of potash were outstanding, the lucerne being 6 to 9 in. taller than the control. Marginal stippling and tip scorch had disappeared. Two cwt. of potash gave a growth response similar to the 3 cwt. treatments, but there were still signs of marginal stippling of the leaves. The response to 1 cwt. of potash also showed marked improvement over control, but marginal stipple and tip scorch of the leaves were still evident and the stand was somewhat uneven.

AUTUMN INSPECTION

Inspection during autumn showed a very marked decrease in grassy and flat weeds on plots which had received 2 and 3 cwt. of potash. Control plots had a heavy infestation of grass and flat weeds. Grass and weeds were still present in the 1 cwt. potash plot, but even so these plots were 100 per cent better than control. Overall, the effect of potash was more evident on plots receiving the basal dressing of hydrated lime. This was probably due to the greater percentage of calcium being applied on these plots as against those receiving carbonate of lime. A heavier dressing of carbonate of lime would probably have given the same results.

SOIL TYPE

The soil type on which these responses were obtained was Hakea (Plains soil) and the soil analysis showed a very low potash test. Results to date indicate that where deficiency of potash occurs on this soil type it can be corrected with applications of from 1½ to 3 cwt. of muriate of potash.

Probably the most interesting result of these trials is that it seems likely that potash applied to lucerne stands on potash-deficient soil will reduce the need for chemical spraying to kill grassy weeds, since these trials have shown that stimulation of the lucerne with potash suppresses weed growth. Rates of muriate of potash for maintenance dressing on lucerne stands have yet to be investigated.

—*M. L. SMETHAM*

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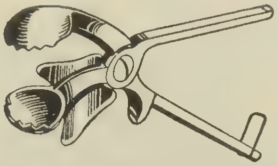

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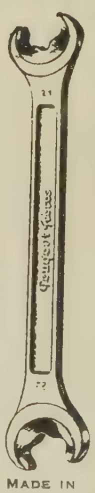

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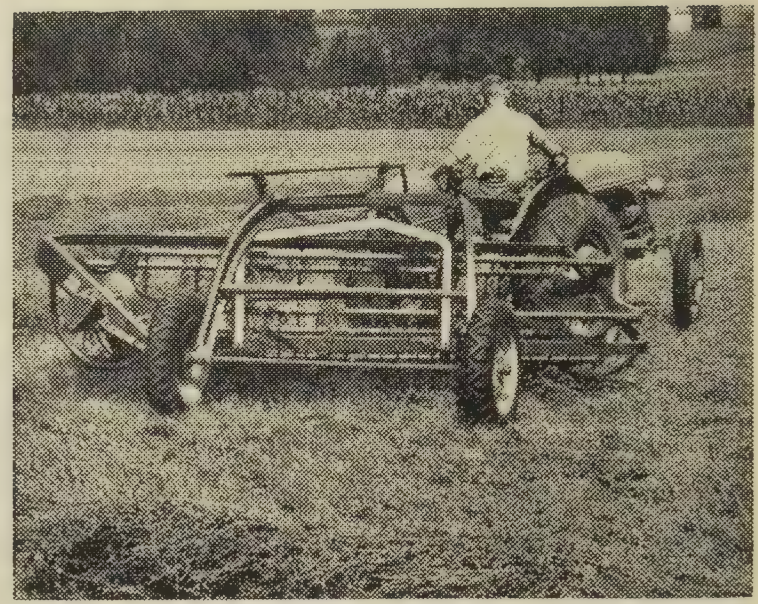

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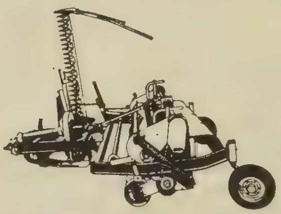

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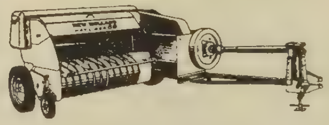

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Investigation of Ill-thrift of Lambs in South Canterbury

By M. C. ARMSTRONG,
Veterinarian, Department of Agriculture, Timaru

THE economic importance and complexity of unthriftiness in lambs have warranted intensive investigation in various districts of New Zealand to find fundamental causes and reliable methods of control for every circumstance. In this article the terms ill-thrift and unthriftiness are considered synonymous because the practical farmer applies both terms to animals failing to thrive for different possible causes such as mineral deficiencies, pasture unpalatabilities, internal parasitism, and inadequate quantity or quality of feed.

ILL-THRIFT occurs in different, sometimes contradictory, circumstances in various parts of New Zealand. For example, summer ill-thrift of unknown cause in Ashburton County in 1956-57 was controlled on short pasture whereas autumn ill-thrift of unknown cause in the North Island was reduced on long pasture. There was, however, a similarity between the occurrence of ill-thrift on light land in South Canterbury and on similar land in Ashburton County the previous summer.

Outbreaks

In the North Island an uthriftiness of lambs known as hogget ill-thrift occurs when autumn rains give vigorous pasture growth after dry conditions in late summer. This autumn ill-thrift is unrelated to mineral deficiencies, but presents a picture of unpalatable pasture associated with a lower dry-matter intake and a lower digestibility of immature, rapidly growing plants. In this peculiar type of ill-thrift a secondary parasitic attack is a frequent complication. E. A. Clarke and D. B. Filmer (1956) reported that the incidence of hogget ill-thrift may be reduced by providing long, mature pasture containing, where possible, a high proportion of white clover, and that losses from parasitism may be reduced by the strategic use of phenothiazine.

In Ashburton County during the summer of 1956-57 the occurrence of heavy mortalities and severe unthriftiness of thousands of lambs was associated with the provision of long, rank, and bulky feed produced on large

Causes and Remedies

- Severe unthriftiness and heavy losses of lambs on light stony soils of South Canterbury between November 1957 and March 1958 were the result of cobalt deficiency and parasitism induced by continued dull, wet, warm weather and a vigorous growth of foliage.

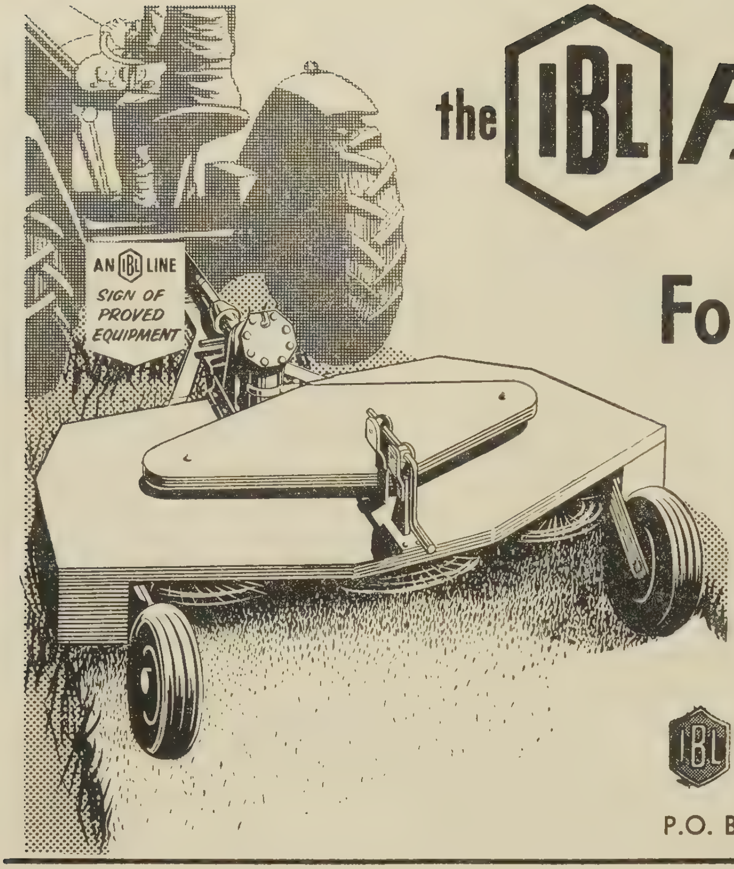
- Investigations and mineral feeding trials by the Animal Industry Division have shown the importance of controlling both cobalt and parasitism. There was no acceptable evidence that supplements of copper and iron were helpful.

- The existence of seasonal cobalt deficiency has been established in several light land soil types which comprise large areas of leached soils on the plains and foothills of Canterbury where ill-thrift of lambs can arise. The significance of the benefits of short pastures and of slow-growing pastures in relation to cobalt contents is discussed in this article.

- Recommendations are given for the provision of cobalt by topdressing or by direct administration and for the control of parasitism.

- It is not suggested that any one formula will apply for the control of ill-thrift on all soil types and the results of this investigation may apply only to light stony soils. Ill-thrift on other soils requires individual investigation for causes such as primary parasitism, unpalatable or toxic feed, or other feed conditions leading to loss of appetite.

▼ Severe unthriftiness from a combination of cobalt deficiency and *Ostertagia* worm infestation in lambs on South Canterbury light land.



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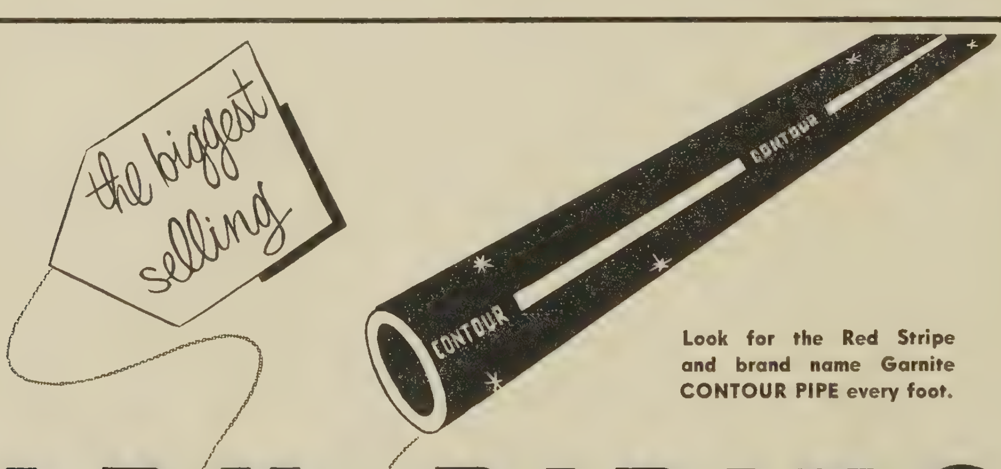

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areas of light shingly soils, particularly Lismore soil types. Unlike the North Island ill-thrift, which is an autumn pasture-complex condition, the Ashburton outbreak was severe from mid November to mid February; that is, a summer setback just as severe on rape crops as on pasture and with no relationship to the species of feed. It was, however, severe on long grazings and reduced on short pasture. The result of a farm management survey by the Department of Agriculture was a recommendation by R. C. Stuart and others (1957) that short feed should be available for all lambs in spring and summer as an aid to the prevention of ill-thrift.

Occurrence in South Canterbury

From November 1957 to March 1958 heavy mortalities and widespread unthriftiness of lambs were experienced under very similar circumstances to those of the Ashburton outbreak the previous season, namely, the middle of summer on long, rank pastures, lucerne, and rape crops growing on light stony soils.

In South Canterbury the Animal Industry Division conducted a detailed veterinary investigation on individual farms over large areas of the Waimate, Geraldine, and Mackenzie Counties. Feed conditions and management were recorded, post-mortems conducted, and specimens sent to the Department of Agriculture's Wallaceville Animal Research Station for diagnosis.

Lamb deaths reached 50 per cent in some flocks and it was not uncommon for all the survivors to be visibly affected by unthriftiness. On the average farm in February the mortality was about 15 per cent and 70 per cent of the survivors were unthrifty.

Areas Affected

Ill-thrift occurred on light stony land in three districts:

1. In the Orton district, Geraldine County, between the Orari and Rangitata Rivers.

2. In Waimate County in a large triangle bounded by the Waitaki River to the south, the coast to the east, and a line from Morven through Pikes Point to Ikawai on the north-west.

3. In the Ashwick district of the Fairlie basin, Mackenzie County.

The soils are light stony silt or sandy loams generously topdressed with lime and superphosphate. Pastures are sown down in high-producing grasses and clovers, particularly perennial ryegrass and white, red, and subterranean clovers. The districts have favourable records for the fattening of lambs in dry summers, but wet summers have often been troublesome.

Seasonal Conditions and Management

On this occasion ill-thrift became apparent and severe **before** weaning, which is done in January on the farms investigated.

Lambs born after the first week in September had not done well from November onward and some heavy losses were experienced by the end of January. From early November to March, there were long periods of dull, changeable, wet weather which promoted a prolific growth of pasture, especially clovers. Pastures were continually wet and rank and set stocking was common practice. With limited numbers of sheep it was impossible to control the abundant pasture growth, because cattle are not usually kept on this light country and topping of pastures is not practised because of the vagaries of climate.

In ordinary seasons very little drenching against worms is done, but on this occasion nearly all farmers dosed their lambs with phenothiazine when the unthriftiness became severe.

Post-mortems

On 22 farms post-mortems were conducted on freshly killed ill-thrift lambs. There was a consistent picture of very low blood volume and a heavy infestation of small stomach worms. Digestion and the assimilation of nourishment appeared to be at a standstill and the only contents of the fourth stomach were parasites in a watery fluid containing lumps of catarrhal mucus.

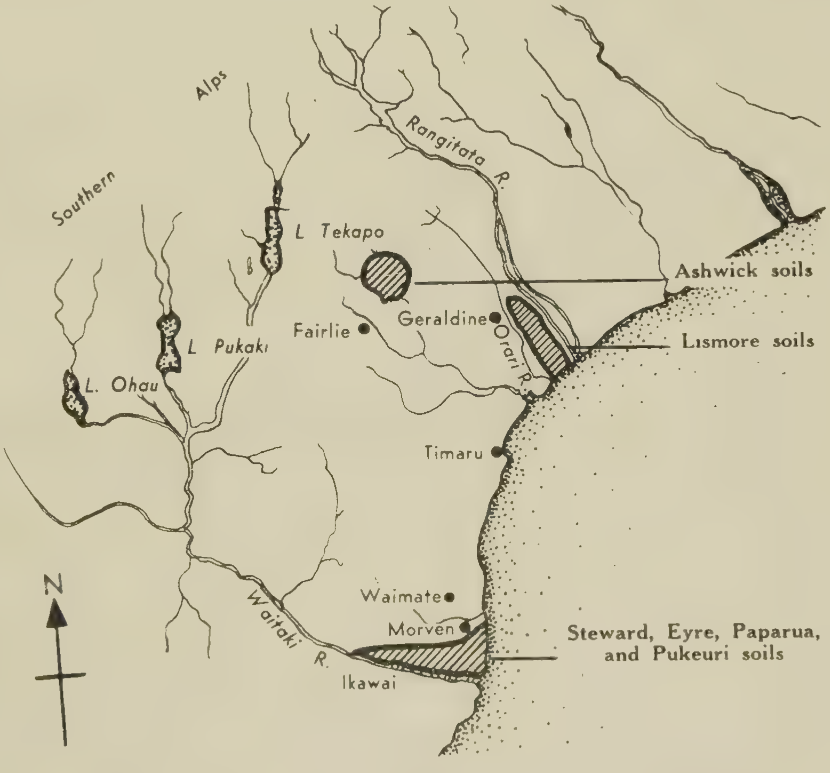
The majority of stomachs showed evidence of ulceration or irritation by the worms. There were no other post-mortem appearances. Livers were submitted to Wallaceville for copper and cobalt estimates and viscera for parasite counts and diagnosis. Scouring was **not** a feature.

Ostertagia Parasitism

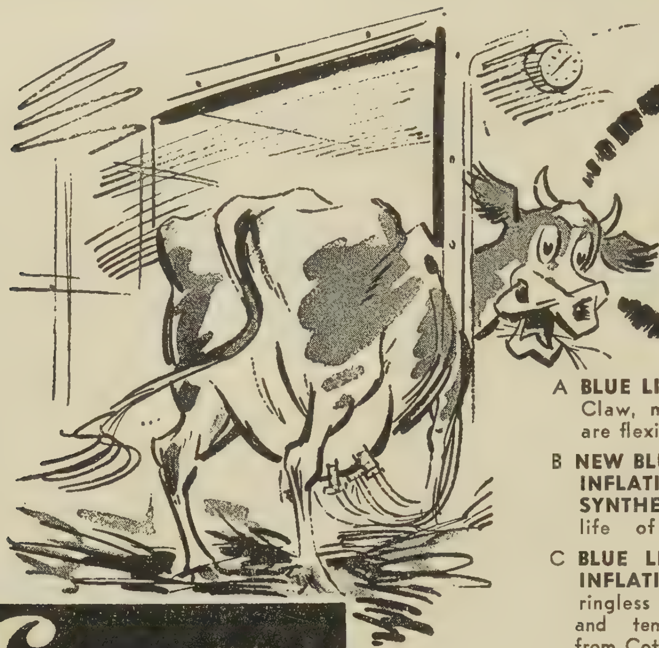
Heavy infestations of *Ostertagia* species of small stomach worms were a consistent finding and very high counts (up to 22,000 *Ostertagia*) were recorded for individual lambs. Ordinary dose rates of phenothiazine and copper sulphate-nicotine sulphate were not effective against *Ostertagia* species, which are very resistant to anthelmintics. Increased dose rates of fine-particle phenothiazine were tried.

Trials on affected farms indicated that control of *Ostertagia* and improvement in lambs were obtained by giving 23 gm. of very fine phenothiazine (particles under 5 microns). This is equivalent to 1½ fl. oz. of a phenothiazine containing at least 60 per cent of particles under 5 microns.

Confirmation under field conditions was given the report of P. L. Thomas and D. C. Elliot (1957) at Wallaceville



Cobalt deficient soils of South Canterbury exposed by the investigation.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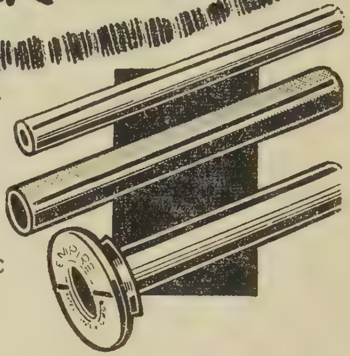

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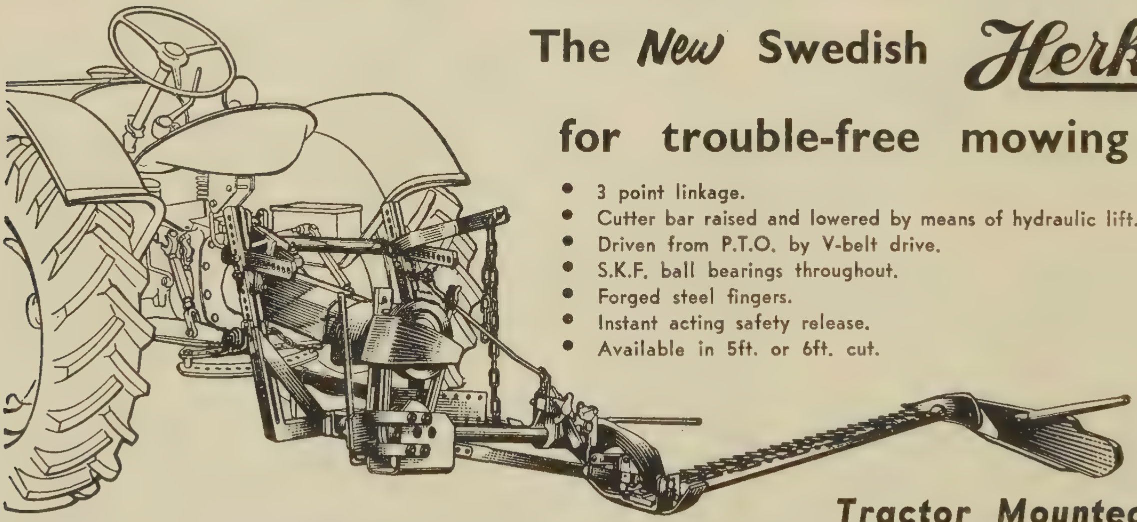

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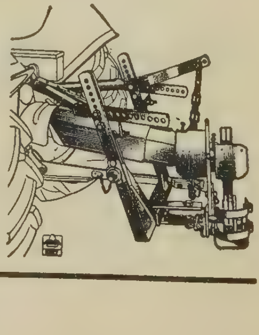

that the finest preparation of phenothiazine used was the only one to give a highly significant reduction against *Ostertagia* spp.

Cobalt Deficiency Trials

The investigators considered that an incipient cobalt deficiency could be an important predisposing cause of the parasite problem because it was limited to the leached gravel soil types and because of the unusually abundant pasture growth. Symptoms of depressed appetite and poor digestion are early effects of cobalt deficiency.

Accordingly in January the Animal Industry Division started seven cobalt-supplement trials in three of which the value of additional copper and iron was tested. All these trials were over 8 weeks and with typical ill-thrift lambs with initial average liveweights of about 40 lb. The standard cobalt drench used was 1 fl. oz. each week of a mixture containing 1 oz. of cobalt sulphate in 5 gallons of water. The standard cobalt, copper, and iron drench used was 1 fl. oz. each week of a mixture containing 1 oz. of cobalt sulphate, 1 lb. of copper sulphate, and 2 lb. of iron sulphate in 5 gallons of water.

Significance of Cobalt

The results of trials 1, 2, 3, 4, 5, and 8 have established the existence of cobalt deficiencies on five light land soils (Pukeuri, Ashwick, Lismore, Steward, and Eyre silt loams). Liver estimates of lambs affected by ill-thrift on vigorous pastures on other farms confirmed that cobalt deficiencies occur on these soils and exposed

DETAILS OF COBALT DEFICIENCY TRIALS

TRIAL 1 (20/1/58 to 20/3/58)

Location: Morven, on Pukeuri shallow silt loam and on Steward very stony silt loam.

Management: All lambs were grazed on long, rank, clover-dominant pasture. They were given 1½ fl. oz. of fine-particle phenothiazine every 3 weeks.

Results

20 lambs cobalt drench each week	21.4 lb. av. gain
20 lambs cobalt, copper, iron each week	19.6 lb. av. gain
20 lambs control	7.3 lb. av. gain

Comments: Cobalt very highly significant; copper and iron of no extra value; controls responded to worm treatments.

TRIAL 2 (26/1/58 to 28/3/58)

Location: Fairlie, on Ashwick very stony silt loam.

Management: All lambs grazed on long, rank pasture and given 1½ fl. oz. of fine-particle phenothiazine every 3 weeks.

Results

30 lambs cobalt drench each week	9.7 lb. av. gain
30 lambs cobalt, copper, iron each week	8.8 lb. av. gain
30 lambs control	4.5 lb. av. gain

Comments: Cobalt very highly significant; copper and iron of no extra value; controls responded to worm treatments.

TRIAL 3 (26/1/58 to 26/3/58)

Location: Orton, on Lismore very stony silt loam.

Management: All lambs grazed on long, rank, clover-dominant pasture and given 1½ fl. oz. fine-particle phenothiazine every 3 weeks.

Results

30 lambs cobalt drench each week	11.7 lb. av. gain
30 lambs cobalt, copper, iron each week	9.7 lb. av. gain
30 lambs control	6.5 lb. av. gain

Comments: Cobalt highly significant; copper and iron of no extra value; controls responded to worm treatments.

TRIAL 4 (20/1/58 to 20/3/58)

Location: Morven, on Steward very stony silt loam.

Management: All lambs set stocked on long, rank cocksfoot and subterranean and red clover pasture. **No worm treatments given.**

Results

20 lambs cobalt drench each week	3.5 lb. av. gain
20 lambs control	9.4 lb. av. **loss**

Comments: Cobalt very highly significant; control lambs without cobalt and no worm treatments were in bad state.

TRIAL 5 (20/1/58 to 20/3/58)

Location: Glenavy, on Steward very stony silt loam.

Management: All lambs grazed extensively on 6 acres of rape and given one dose of 1½ fl. oz. of fine-particle phenothiazine at the start.

Results

20 lambs cobalt bullet	7.0 lb. av. gain
20 lambs control	1.3 lb. av. gain

Comments: Cobalt very highly significant. Rape failed to provide sufficient cobalt. This is the first recorded instance of cobalt deficiency on a brassica crop.

TRIAL 6 (26/1/58 to 26/3/58)

Location: Fairlie, on Ashwick very stony silt loam.

Management: All lambs on very short grazing on half-ploughed paddock, weeds, and soil and given 1½ fl. oz. of fine-particle phenothiazine every 2 weeks.

Results

30 lambs cobalt drench each week	16.1 lb. av. gain
30 lambs control	15.0 lb. av. gain

Comments: All lambs responded very well to short grazing and phenothiazine. The intake of soil cobalt is considered to have masked the true assessment of the cobalt drench.

TRIAL 7 (20/1/58 to 20/3/58)

Location: Morven, on Steward very stony silt loam.

Management: All lambs were shifted each week on short unimproved pasture, weeds, and access to soil and given phenothiazine every 3 weeks.

Results

20 lambs cobalt drench each week	3.5 lb. av. gain
20 lambs control	3.5 lb. av. gain

Comments: The intake of soil cobalt and possibly a higher cobalt level in slow-growing unimproved pasture concealed a deficiency. Liveweight gains were limited by the poor feed. Before this trial started a liver from a lamb that had been on rank improved pasture showed a low cobalt content of 0.02 parts per million.

TRIAL 8 (24/12/57 to 28/2/58)

Location: Glenavy, on Eyre very stony sandy silt loam.

Management: All lambs were grazed on long, rank pasture and no worm-control measures were applied. The lambs, which averaged 70 lb., were in fair order at the start of the trial, which was conducted by the Waimate Farmers' Veterinary Club. This farm had a history of trouble after weaning.

Results

20 lambs cobalt drench each week	8.7 lb. av. gain
20 lambs control	5.0 lb. av. **loss**

Comments: Cobalt highly significant; decline of control lambs aggravated by the ravages of parasites.

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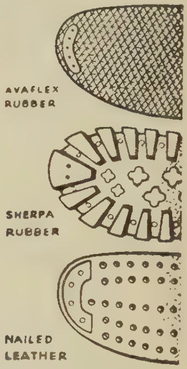

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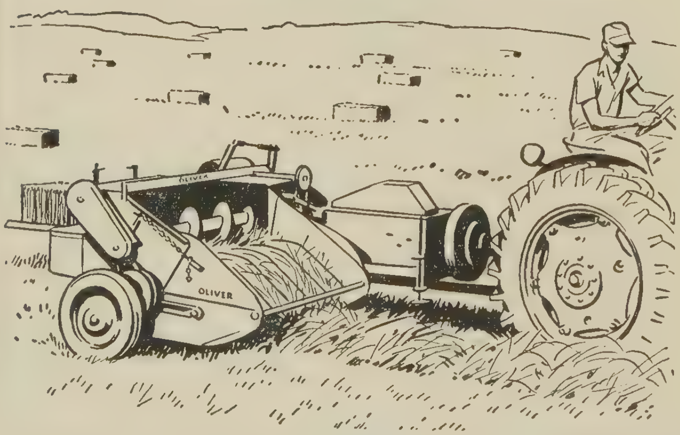


These lambs on abundant, clover-dominant pasture on a South Canterbury stony silt loam were showing lack of appetite and unthriftiness associated with cobalt deficiency and *Ostertagia* worm infestation.

a deficiency on Paparua stony sandy silt loam near the Waitaki River. Liver estimates from all these soils were low (0.02 and 0.03 parts per million of cobalt).

Though in trial 6 the beneficial effect of cobalt was small and in trial 7 there was no difference in the groups, a liver from a lamb on rank pasture obtained before trial 7 began had a low (0.02 p.p.m.) cobalt content. The lambs in both these trials were managed on very short pasture with easy access to soil.

Cobalt in Soil Eaten with Short Pasture

Experiments by the Department of Agriculture in Southland by E. D. Andrews and others (1958) have indicated that cobalt deficiency disease in lambs is likely to be more severe on long pasture than on short pasture at the same time. This confirms observations by J. K. Dixon (1936), who noticed that short pastures were beneficial in controlling mild cobalt deficiency disease in lambs at Morton Mains, Southland.

A greater amount of soil would be eaten with short pasture than with long, cleaner pasture. Because soil contains about 30 times as much cobalt as pasture, it is considered that the ingestion of soil with short or heavily grazed pasture provides sufficient cobalt for lambs on mild deficiency areas. This was demonstrated in experiments on mild deficiency land at the Winton Experimental Farm in 1952 and 1953, when the only variable was the length of pasture grazed. Lambs showed cobalt deficiency on pastures over 3 in. long, but were protected on pastures about 1 in. long.

J. K. Dixon (1936) reported that oral doses of soil would prevent cobalt deficiency disease in sheep. Since then there have been many anomalies in experiences with lambs on country on the borderline of deficiency. These can be explained by the different amounts of soil consumed with the feed under various climates and grazing systems.

Cobalt Variations in Pasture

In ordinary dry summers on light land, when plant growth is slower and pastures short, almost all lambs in most years have apparently been able to obtain adequate supplies of cobalt. On soils on the borderline of deficiency under climatic conditions favouring rapid, lush growth plants may contain insufficient cobalt to maintain the animals' health and resistance to disease. Under conditions less favourable for growth on the same soils the slower growing plants take up a little more cobalt—often enough for the animals' health.

Seasonal variations indicate that the cobalt content of pasture tends to decrease in spring and summer and increase in late autumn and winter. New Zealand observations are that seasons favouring lush growth of pastures tend to cause the development of cobalt deficiency disease (E. D. Andrews, 1956). The effect is probably a double one due to longer, cleaner pasture with less soil contamination and to a lower cobalt uptake by rapidly growing plants.

Effect of Fertilisers

Ill-thrift was associated with light land which had been liberally topdressed with lime and superphosphate and where pasture growth was rapid because of enhanced fertility and dull, wet weather. There is evidence from trace element investigations in New Zealand (E. B. Davies, 1957) that heavy applications of lime can induce cobalt deficiencies.

On the light land farms in this investigation there was no correlation between incidence of ill-thrift and the quantity of lime used per acre during the previous 6 years. Some areas had received 6 tons per acre, but others with more ill-thrift had received 2 tons per acre. Nevertheless, farmers are recommended to avoid excessive lime applications and to use lime and fertilisers at rates recommended by local Instructors in Agriculture.

Consideration of the cobalt variations in pasture growing at different rates, the direct and indirect effects of fertilisers on cobalt uptake by plants, and the effects of soil intake with short pasture will help toward an explanation of the increasing incidence of cobalt deficiencies under improved-fertility, high-foliage-producing conditions, especially in the wetter seasons of abundant, clean growth.

Significance of Internal Parasites

The most consistent post-mortem findings were heavy worm burdens, which had the severest effects on animals already retarded by cobalt deficiency. In the cobalt trials where groups of lambs were given worm treatment only there was a good response in improved vigour and liveweight gains. The great advantage in weight gains by controlling parasites in addition to correcting any cobalt deficiency has emphasised that the effects on health of so-called secondary parasites, particularly *Ostertagia* species, should not be lightly brushed aside. The degree to which these parasites are harmful depends on the relationship of the numbers present to the resistance of the host.

During this investigation in South Canterbury the infective potential of parasites has been greatly favoured by long periods of dull, warm, wet weather resulting in mass hatchings of eggs and great activity and survival of infective larvae on wet grazings.

Copper and Iron Tested

Representative livers were forwarded to Wallaceville for copper estimations and satisfactory figures were obtained. Furthermore, no benefit was obtained in three trials which tested the value of additional copper and iron given as a drench every week to unthrifty lambs. Studies on copper levels of livers and pastures are being continued in the areas of this investigation. Molybdenum has not been used on the soils concerned in this report.

Soils Showing Seasonal Deficiency

As a result of this survey by the Animal Industry Division in South Canterbury the soil types known to be affected by seasonal cobalt deficiency are the following free-draining, and therefore easily leached, soils:

Ashwick stony silt loams in the Fairlie district; Lismore stony silt loams in the Orton district; and Steward stony silt loams, Paparua stony silt and sandy loams, Eyre stony silt and sandy loams, and Pukeuri shallow silt loams from Morven to the Waitaki River extending as far as Ikawai in the form of a large triangular district including Pikes Point.

Seasonal cobalt deficiency could probably occur on all light stony soils when climate and pasture improvement give lush growth. The findings of this investigation could be of importance to other areas of similar stony soils belonging to the Lismore, Steward, Paparua, Eyre, and Pukeuri soil types, which occur over extensive areas of the plains of Canterbury and to the foothills.

Recommendations

Farmers on the light stony soils are recommended to:

1. **Provide additional cobalt for sheep by either:**
   (a) Applying cobalt sulphate at 5 oz. per acre annually as a solution or in topdressing in early spring for preference.
   (b) Giving cobalt bullets to all lambs at 6 weeks old or to newly purchased store lambs and replacement lambs.
   (c) Arranging a cobalt bullet trial in doubtful cases and testing for a deficiency when unthriftiness is apparent or retarded growth suspected. The weight gains of 20 ear tag numbered lambs dosed with cobalt bullets can be compared over 8 weeks with the individual weight performances of 20 ear tag numbered lambs that have no cobalt supplied.
2. **Control internal parasites:** Good results should follow the strategic use of a fine-particle phenothiazine containing a high percentage of particles under 5 microns. If trouble sets in, the ordinary dose should be increased to 1½ times and drenching repeated at intervals of 3 weeks for all unthrifty lambs. Take precautions during and just after periods of dull, wet weather. It is advisable to adopt a 7-day shift on to clean, spelled feed during "wormy" weather and to prevent lambs from continually foraging over previously used breaks of feed crops to reduce intake of parasites.

Acknowledgment

Diagnostic work and information supplied by the Wallaceville Animal Research Station and access to the result of a cobalt trial supervised by the Waimate Veterinary Club are acknowledged. The author is indebted to E. D. Andrews, Principal Scientific Officer, Wallaceville, for statistical analyses and communications.

References

E. D. Andrews (1958), personal communication.

E. D. Andrews (1956), "Cobalt Deficiency", "The New Zealand Journal of Agriculture", vol. 92, pp. 239-244.

E. D. Andrews, B. J. Stephenson, J. P. Anderson, and W. C. Faithful (1957), "The Effects of Length of Pastures on Cobalt-deficiency in Lambs", "New Zealand Journal of Agricultural Research", vol. 1, pp. 125-139.

E. A. Clarke and D. B. Filmer (1956), "Hogget Rearing", "The New Zealand Journal of Agriculture", vol. 92, pp. 115-120.

E. B. Davies (1957), "Trace Elements in Plant Nutrition", "Proceedings of the Ruakura Farmers' Conference 1957", pp. 85-95.

J. K. Dixon (1936), "Investigations on a Sheep Ailment in Southland", "New Zealand Journal of Science and Technology", vol. 17, pp. 609-619.

R. C. Stuart, H. H. Tocker, E. Stonyer, and H. Evans (1957), "Lamb Ill-thrift in Ashburton County", "The New Zealand Journal of Agriculture", vol. 95, pp. 449-456.

Thomas, P. L., and Elliott, D. C. (1957), "New Zealand Veterinary Journal", 5 : 66.

Meteorological Records for July

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	51.6	+ 1.1	65.1	33.4	11.91	27	+ 4.52	1.36	8	102
Auckland	160	51.2	— 0.2	63.5	39.0	7.29	22	+ 1.83	1.02	2	98
Tauranga	10	47.9	— 0.8	60.8	28.6	4.11	18	— 0.93	0.91	2	111
Ruakura	131	46.0	— 0.5	61.6	24.3	5.66	19	+ 0.93	1.04	10	84
Whakarewarewa ..	1006	44.6	+ 0.3	56.5	27.4	5.33	16	+ 0.50	2.12	18	88
Gisborne	14	47.8	+ 0.1	67.0	32.8	3.71	22	— 0.70	0.86	30	76
New Plymouth ..	160	48.6	— 0.3	61.0	34.8	9.63	16	+ 3.27	2.48	16	117
Karioi	2125	40.2	— 0.2	57.0	23.0	4.16	14	— 0.03	0.85	16	
Napier	5	48.0	+ 0.7	64.5	31.9	1.93	20	— 1.50	0.65	30	86
Wanganui	72	45.7	— 1.9	61.6	29.0	2.12	12	— 0.80	0.53	16	101
Palmerston North ..	110	46.4	+ 0.3	59.3	27.3	2.91	16	— 0.13	0.60	10	94
Waingawa	340	43.4	— 1.1	61.0	26.0	1.58	15	— 2.36	0.31	31	70
Wellington	415	46.0	— 0.3	56.0	33.8	2.13	13	— 3.23	1.20	18	102
Nelson airfield ..	5	42.0	— 1.3	57.3	23.2	3.18	7	— 0.05	2.09	18	161
Blenheim	12	43.6	— 0.5	59.7	26.3	2.02	5	— 0.59	1.47	18	132
Hokitika	15	42.0	— 1.6	55.9	26.4	7.94	13	— 0.56	1.37	18	138
Hanmer	1270	37.0	— 1.5	56.0	15.0	0.75	3	— 3.45	0.60	18	122
Christchurch ..	22	41.2	— 1.1	60.6	23.2	0.68	10	— 1.92	0.17	5	114
Ashburton	323	38.2	— 2.9	59.0	18.6	0.59	3	— 2.03	0.46	18	146
Timaru	56	38.4	— 3.0	53.9	23.7	0.87	8	— 0.86	0.37	18	125
Alexandra	520	31.1	— 5.2	50.0	15.0	0.36	4	— 0.30	0.17	18	72
Taieri	80	37.5	— 3.5	57.1	16.8	1.90	13	— 0.04	0.66	28	102
Invercargill airfield ..	0	38.2	— 2.3	56.9	22.7	1.75	14	— 1.06	0.61	19	94
Chatham Islands ..	140	44.3	— 1.3	55.0	32.5	3.80	22	+ 0.22	1.05	27	

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during June 1958 and for the 11 months ended 30 June 1958 with comparative figures for the same month and the 11 months of 1956-57 have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:

BUTTER

Period	Creamery (tons)	Whey (tons)	Total (tons)	Percentage inc. or dec.
June 1958	388	10	398	—
June 1957	332	11	343	—
Increase or decrease	+56	—1	+55	+16.035
11 months ended 30/6/58	171,260	2,866	174,126	—
11 months ended 30/6/57	151,989	2,904	154,893	—
Increase or decrease	+19,271	—38	+19,233	+12.417

Butter in store at 30 June 1958 was 15,509 tons

CHEESE

Period	White (tons)	Coloured (tons)	Total (tons)	Percentage inc. or dec.
June 1958	1,067	1	1,068	—
June 1957	947	3	950	—
Increase or decrease	+120	—2	+118	+12.421
11 months ended 30/6/58	77,697	13,251	90,948	—
11 months ended 30/6/57	79,786	10,357	90,143	—
Increase or decrease	—2,089	+2,894	+805	+0.893

Cheese in store at 30 June 1958 was 15,466 tons

If these figures are converted into butterfat equivalent, there is an increase of 10.023 per cent in butterfat graded for the 11 months as compared with the preceding season. The above figures refer only to butter and cheese graded for export, and owing to diversions which may take place they are not necessarily a true indication of production trends.

MEETING THE CHANGING MARKET FOR OUR MEAT

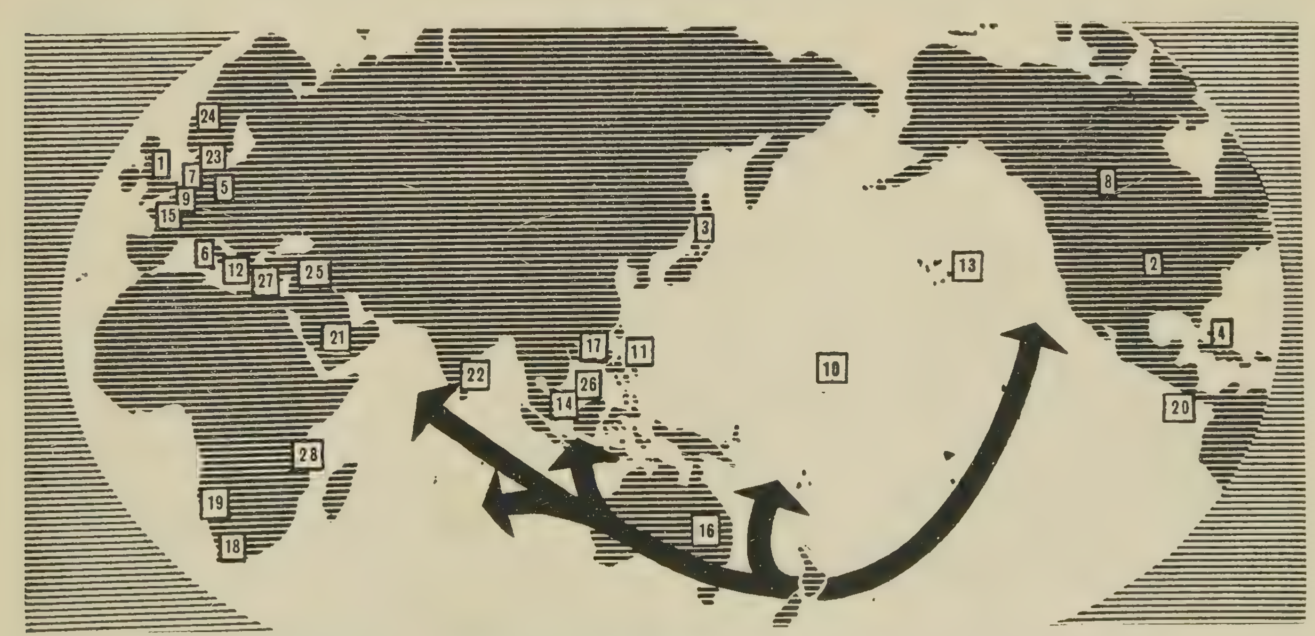
OUR traditional market for meat in the United Kingdom is shrinking and likely to continue to do so. Against this rising standards of living in many parts of the world are creating a demand for meat. What is being done to see that New Zealand capitalises on every opportunity to sell its meat to greatest advantage is described in this article, which was contributed as a paper to the 1958 Ruakura Farmers' Conference by Mr L. A. P. Sherriff, a member of the New Zealand Meat Producers Board. Mr Sherriff impresses on farmers that established markets will best be preserved and new markets won or expanded by maintenance of the highest standards of quality.

IN the first three-quarters of a century of our meat export trade—that is, until very recent times—there was really no changing market for meat. Throughout those years almost the entire export production from New Zealand was sold on the United Kingdom market. The only changes of significance were those arising from the general rise and fall of primary produce prices; the periods of bulk purchase and sale during and after two world wars; the development of the chilling process for beef; and the comparatively slight variation in consumer preference. All of these changes occurred within the same basic pattern of marketing.

Today that pattern remains for practically all classes of our meat, but in the few years since the end of rationing and bulk purchase in the United Kingdom in 1954 there have been developments which have produced in the meat industry a profound sense of change and a widening of horizons and responsibilities, and have presented a challenge to the industry's adaptability after long years of established routines and rule-of-thumb methods in marketing. That challenge is being vigorously taken up with extremely encouraging results. I believe it is reasonable to conclude that our meat export trade, which already earns about a quarter of the country's income from primary produce exports (it contributed £70.9 million in 1957) must provide an increasing share of our export receipts in future.

Encouraging Greater Production

The Meat Board has been conscious of very considerable responsibilities not only to the producer but to the country as a whole in the development of our trade. During and after the Second World War, in view of the British Government's request for increased supplies, the board, as administrator of the Meat Industry Reserve Account in conjunction with the Government, and with full Government approval, took steps by financial investment to promote increased production of meat.



New markets are being opened up for New Zealand meat round the world. The 28 different countries to which meat is being shipped this year are shown on this map. 1—United Kingdom. 2—U.S.A. 3—Japan. 4—West Indies and Caribbean. 5—Germany. 6—Italy. 7—Holland. 8—Canada. 9—Belgium. 10—Pacific Islands. 11—Philippines. 12—Greece. 13—Honolulu. 14—Malaya. 15—France. 16—Australia. 17—Hong Kong. 18—South Africa. 19—West Africa. 20—Panama. 21—Arabia. 22—India and Ceylon. 23—Denmark. 24—Norway. 25—Iraq. 26—Borneo. 27—Cyprus. 28—East Africa.

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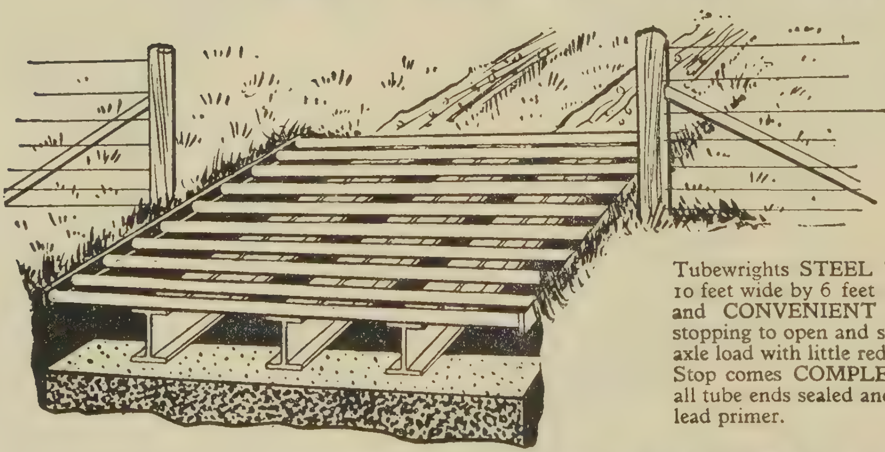

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Funds were invested in the establishment of fertiliser works owned and controlled by farmer-shareholders at Napier, Tauranga, and Awarua in Southland. Loans were also advanced to aerial topdressing firms to enable them to convert to modern aircraft. These were two major points of policy designed toward increasing production by expanding the carrying capacity of existing farms and converting the traditional role of hill country farming in many instances from that of producing only store stock to that of the fattening farm.

More recently new urgency has been given to this drive for production, for we are told by statisticians that we must plan to supply food and sufficient export income to sustain a third and possibly a fourth million of population by the 1980s. Fortunately, well considered planning for increased meat production by way of new techniques and aids to agriculture has contributed greatly toward increase in production already. As carrying capacity has risen we have had a phenomenal increase in our breeding ewe population—almost 26 per cent in 5 years, one more ewe for every four carried 5 years ago. In one year (1957) our breeding ewe numbers rose nearly 2 million.

Our meat export volume has risen from 297,000 tons in 1938-39 to just on 400,000 tons in 1956-57, the last complete year for which returns are available. We have the prospect of continuing expansion of our export surplus. This we have had to foresee. The Meat Board, having responsibility for the guidance of our industry and promotion of the sale of its product overseas, has felt that it must embark on a bold yet fully considered policy of study and development of markets.

Leading Position as Exporter

In considering the changing market for meat we must first realise that though we are a very small nation, we are the greatest exporters of lamb and mutton. We are the **only** large exporters in the lamb and mutton trade. Our production policies have been based on sheep raising and have been devised to meet the requirements of a particular market, the United Kingdom.

In any consideration of New Zealand export meat marketing it should be noted that nearly 50 per cent of our meat exports by volume and about 60 per cent by value is lamb. If we add mutton, we find that about two-thirds of the weight of our export meat is comprised of sheep meats. It must then be realised that 98½ per cent of our lamb and 92 per cent of our mutton are still absorbed by the United Kingdom. At present the United Kingdom offers the only market of any substantial importance for mutton and lamb. These meats are not widely eaten in other meat-importing countries.

Our first consideration must therefore be the requirements of the United Kingdom mutton and lamb market. We cannot look at this market without also taking into account supply, price, and consumption of meat of all kinds in the United Kingdom. We also have to note that **apart from the present year,** in which a most welcome increase has been found in our beef market in North America, the permanency of which no one can foretell, the United Kingdom has still been absorbing about half our export beef.

United Kingdom Market

The present United Kingdom meat market is heavily supplied. The policy of substantial subsidy, which successive governments have maintained, has produced its intended result. United Kingdom beef production has been steadily rising and on the evidence of all available data it must be expected to increase. The output of mutton and lamb, though increasing more slowly, shows signs of more marked expansion. The result has been that for the first quarter of the present year the United Kingdom derived from her own farms 63 per cent of the meat she consumed. This compares with the 61 per cent produced in the first quarter of 1957 and only about 50 per cent of a smaller total consumption before the war.

These figures indicate the trend which the United Kingdom subsidy policy has promoted. The cost of production remains very high and is increasing, and it must be realised as an undisputed fact that beyond a certain level subsidised production is uneconomic. But the subsidy enables the home-killed meat to compete more effectively with the more cheaply produced imported meat and helps to restrain meat prices generally, thereby indirectly returning to the United Kingdom taxpayer something of the large sum he is obliged to spend annually in subsidy to the home producer; at the same time the cost of imported meat is kept down, which vitally concerns us in New Zealand.

While United Kingdom production has been increasing so also has the total supply from countries exporting to the market. Per capita and total consumption of meat in the United Kingdom have expanded to a level above that of pre-war years, but it is unlikely that this consumption will increase as rapidly in future as it has done in the years since rationing ceased. There is, therefore, prospect of a static or reduced market for meat imports into the United Kingdom. At the same time the major exporting countries are expanding their export surpluses.

For a considerable number of years the Meat Board has fully realised the vital importance of this development and has taken opportunity to impress this on New Zealand Governments. It is claimed for New Zealand that under the terms of the Ottawa Agreement of 1933, which though a quarter of a century old still largely influences the pattern of trade between New Zealand and the United Kingdom, Commonwealth suppliers have the right to share the market with the United Kingdom producer, with foreign suppliers in third place. This case is currently being represented and annual consultations have now been instituted between the United Kingdom and New Zealand on production and import policies.

At the same time it has been possible to reduce the weight of New Zealand meat on the United Kingdom market by the energetic pursuit of markets elsewhere. We have been favoured with attractive opportunities, and we are taking the initiative to develop more. These I shall consider shortly. Meanwhile, bearing in mind that for the foreseeable future the United Kingdom is likely to remain our major market, it is desirable to consider the changing requirements of our customers there.

Preference for Light Lambs

Throughout the years of the bulk-purchase contracts during and immediately after the war the United Kingdom housewife had no freedom of choice. A strong aversion to fat was built up and now because of this and also from the point of view of economy and changed eating habits the British housewife is still more unfavourably disposed toward fat with her meat. She, and in turn the butcher, look for the lean because she refuses to pay a high price for the fat. This trend favours New Zealand lamb, since our lamb trade has been built in the main on the 29 to 36 lb. lamb (the two grade), which is considerably lighter than the heavy lambs comprising the major portion of United Kingdom production.

The even grading and quality of our lamb, accompanied by intensive sales promotion — extended lately to television—have established a demand for it which continues to give us a marked premium over all other imported lamb and which in the years since the war has steadily reduced the margin between the average values of New Zealand and those of United Kingdom-produced lamb. Our product is in fact today being represented by meat trade experts to British producers as a model on which they should base a revision of their production pattern.

But we have to note the great emphasis placed on the leaner carcass. You will have noted this in the comments in recent seasons from the London judges of our export lamb

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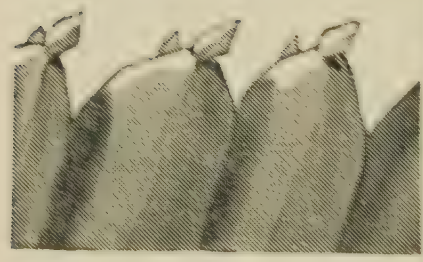

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competitions and from many other sources. The judges this year observed: "A lamb of the old-time recognised show standard, prime but overfat, is now a thing of the past, and the urgent necessity for the trade today is a 30/32 lb. prime carcass of good conformation and with full meat content and a minimum of waste."

I should emphasise that the point at issue is the difference between a prime lamb, which is wanted, and an overfat lamb, which is not wanted.

For the producer, therefore, the emphasis may well be on the quick-growing, early maturing animal which can be most economically produced. This point was effectively made by Dr John Hammond during his recent tour of New Zealand at the invitation of the Meat Board. Dr Hammond said the meat producer of today had two people to please, the butcher and the consumer. The meat producer (in our case the New Zealand farmer) wants fast-maturing animals, which give him a rapid turnover and a good profit. The butcher wants profitable carcasses, with a high proportion of the better cuts. The consumer wants tender meat with not too much fat.

Quality of the meat, of course, is a major objective, but there are varying ideas of what is meant by quality.

Dr Hammond said: "My definition of quality in meat is that which the public will pay more than the average price for." This is a commercially sound definition.

Dr Hammond said that different joints from the carcass sold at very different prices per pound, so the emphasis was on increasing not only the eating quality of the meat itself, but the proportion of the more valuable cuts in the carcass.

Summing up, he said that the main object in producing quality carcasses was to bring the animal to the optimum weight as quickly and as **evenly** as possible to get the most valuable proportions and the more tender meat without too much fat. "Evenly" must be closely related to type, selection, and breeding.

Markets Outside U.K.

Our potential export surplus of meat, notwithstanding the expected growth of our domestic consumption, is undoubtedly very great. It follows therefore that market prospects must be assessed and measures taken to ensure the most vigorous pursuit of every opportunity, not only in existing markets but in the development of new outlets wherever possible, on a long-term as well as a short-term basis.

Fortunately for us, our policies in the past have endowed us with breeding stock of very high quality with a clean bill of health. New Zealand's freedom from foot and mouth disease plays a very significant part in our opportunities to exploit trade with many countries. Fortunately for us also, rising living standards coupled with rising populations and increasing expenditure on food not only in the Western world but also in other countries, are promoting increased demand for meat. Meat consumption is very sensitive to economic trends. While prosperity continues in general our opportunities may be expected to continue to grow.

The enterprise of our exporters has enabled the country to enjoy expanding sales of meats in markets outside the United Kingdom since bulk purchase ended in 1954. Though such sales were of minor consequence in the pre-war years, from last season's production 75,500 tons or 19.7 per cent was sold outside Britain, and in the present season this total may be still greater. From the start of the present season on 1 October 1957 to the end of April 1958 the total of meat sent to other markets was double that of the same period of last season and constituted 20 per cent of our shipments abroad for the period.

Next Objective

The Meat Board some time ago believed that 20 per cent of our export to markets other than the United Kingdom was a desirable goal, but hardly attainable. Now, with changing conditions, this objective must be revised, not only in the light of the already substantially increased United Kingdom production but in view of potential production from United Kingdom farms. I feel that the sale of 30 per cent of our exports outside the United Kingdom should be our next objective.

These alternative markets are doubly valuable in that they relieve the weight of meat going into the United Kingdom and sales are invariably made at prices in advance of those ruling in Britain. Furthermore they are markets which usually buy at prices negotiated before the meat leaves New Zealand, whereas in the United Kingdom our prices generally are subject to market fluctuation after shipment.

Some of the alternative markets have been consistent over the years. Such countries as the West Indies and Italy, for instance, have been regular and substantial purchasers. But the international trade in meat is constantly subject to political policies and, of course, to the balance of payments problems which importing countries are liable to have. The stability of trade with one country or with many countries may, too, be affected, as it has been this year, by the entry of another purchaser offering higher prices to New Zealand.

North America

The strong demand from North America for beef to help fill a gap caused by shortage of cattle for slaughter this year has expanded more rapidly than expected and opens up the possibility of a continued and very important trade in meat to that area. The Meat Board is convinced that the utmost effort must be made in every possible direction to ensure a continuance and development of trade with Canada and the United States. I feel sure that our very good neighbours on the North American continent would be happy that this should be so.

Of course New Zealand must present her meat in the manner required by any particular market if trade is to continue there.

The board with its responsibilities in the supervision of the trade is well aware of this fact and has taken steps, together with the Department of Agriculture, to ensure that the presentation of beef to North America is in accord with the special requirements there. The board has been gratified to have the full cooperation of the exporters. They have taken energetic action to produce an article which is going to take its place, as our lamb has done, as the best of its kind in the world.

U.S.A. Trade Outprices Others

The American trade has outpriced others. In some respects this is regrettable. We want to maintain a regular supply to good customers. But it is in the nature of trade that supplies go in the main to the buyer paying the best price, and to attempt arbitrarily to alter this concept would be neither practicable nor wise.

We are fortunate in that this is a rather more acceptable problem to have to deal with than those confronting exporters of other types of New Zealand primary produce today. But it is one to which close consideration must be and is being given. If we could overnight expand our cattle population and produce a very much greater quantity of beef this season, we could probably market it satisfactorily; but beef production is a longer-term proposition. For the New Zealand farmer it must be worthy of note, however—and I cannot stress this too strongly—that most of our expanding outlets in world markets at present are for **beef**. Our customers have remarkably few opportunities to buy disease-free beef comparable in quality to that which New Zealand can offer.

Though the present demand for boneless beef has turned traditional ideas of relative values upside down, the beef producer would be very unwise to neglect the lessons of the past, which teach the wisdom of putting the

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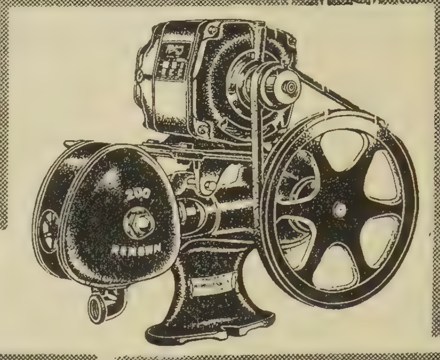

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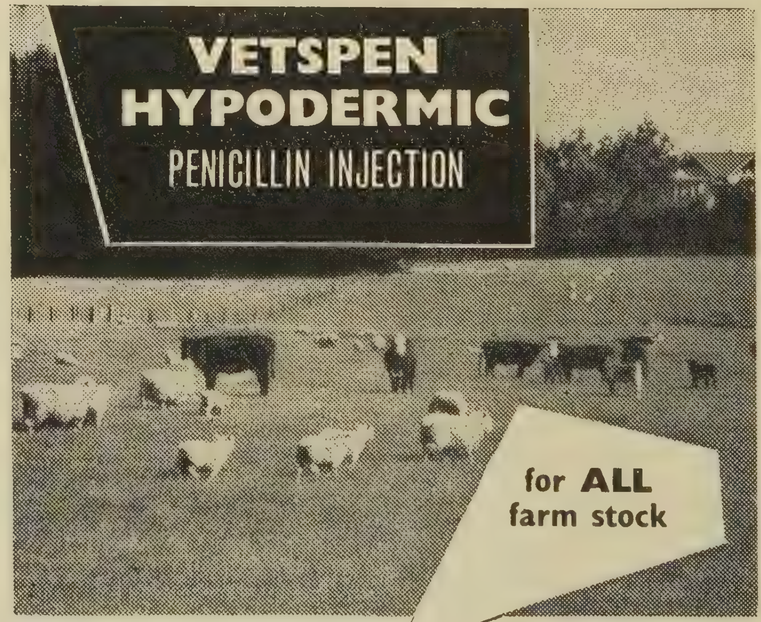

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emphasis on quality. Our stud beef breeders over the years have given a notable lead and are contributing much not only to the maintenance but to the further improvement of the standard of our beef herds by their enterprise in importing top-grade stud beasts.

The Meat Board and many others have planned and consistently endeavoured not only to maintain and improve still further the quality of beef but to step up the quantity available for export. It is the concept and furtherance of such a policy that has placed us ahead of our competitors in the lamb market. We should not permit ourselves to be diverted from this same policy in beef production by present events, which put the value of beef suitable for manufacturing out of balance with the value of quality beef recognised as "chiller type". Quality is still important.

There is at this stage no certain indication of how long present beef values in America will continue, but there is official belief in the United States that though cattle numbers there are estimated to be recovering more quickly than had been previously expected, domestic production of beef may fall considerably short of requirements until about 1959-60. We should be reasonably able to look forward to a continuing demand, particularly for our packaged, boneless beef, which is a product in line with the requirements of modern marketing, standardised in style and weight of package, and easily managed by the manufacturer. It is unsurpassed in quality in its particular sphere.

Europe

Since the war our meat has gone into Europe chiefly through West Germany, Italy, Belgium, and the Netherlands. Of our 1956-57 season's exports Europe took 21,000 tons or nearly 5½ per cent. Imports of meat to the Continent fluctuate in accord with domestic supply and political factors. Protection of agriculture is a very general policy and all European countries impose restrictions of one kind or another on imports. This season, chiefly because of the strong demand for our beef elsewhere, comparatively light supplies of our meat are entering Europe.

In the longer term the European trade will be subject to developments arising from the introduction from 1 January 1958 of the European Common Market, of which six countries—West Germany, France, Italy, the Netherlands, Belgium, and Luxemburg—are members. The common market countries eventually will bring their tariffs on to a common level, involving generally higher tariffs on meat imports. The likely full effects of the common market scheme and of the wider free trade area proposed for Europe by the United Kingdom are still uncertain. The prospect is one of greater domestic production in Europe, but with the possibility that improving living standards may increase meat consumption.

New Zealand sales to Greece constituted a valuable outlet for ewe mutton (about 7,000 tons from the **1955-56** season's production). The Suez dispute eliminated this trade for a time and also that to Egypt. Sales to Greece have since been resumed. Other prospects in the eastern Mediterranean are being developed this year including the sale of ewe mutton to Turkey.

West Indies and Caribbean

The West Indies and Caribbean area constitute another example of how improving living standards increase the demand for meat. Our sales to these areas, though they comprise only about 1.8 per cent of our exports, constitute a steady market, taking about 7,000 tons of our meat, comprising mainly quarter beef. Recent investigations suggest that there will be room for expansion of this trade. Here again availability of supplies from New Zealand will be an important factor.

Japan

A new element in our trading was the entry of Japan into the beef market last year. She bought 15,650 tons of our 1956-57 season's meat. There seems no doubt that if Japan can maintain her improved living standards and if balance of payments problems do not stand in the way or political considerations operate against us, the Japanese market will continue to be interested in our product. Here again the quality and standards of hygiene we are maintaining are major assets.

In the first year of substantial importing (last year) there was some confusion among Japanese traders as to the types and quantity which the market needed. Today there is apparently a much better assessment of requirements and more interest is directed to G.A.Q. quarter beef. Two factors, however, have combined to reduce the amount that will be bought from New Zealand this year: Balance of payments and other problems have caused the Japanese Government to restrict spending on meat imports; a cut in funds was recently estimated to involve a reduction of total meat imports from last year's 25,000 tons to 15,000 tons, of which a principal part would be drawn from New Zealand. Since last year, however, the price of New Zealand beef has risen because of the demand from other markets, and it is still uncertain whether Japan will be prepared to meet these price levels this season.

I have mentioned principal markets. There are numerous others to which smaller quantities of our meat go. These markets are under constant study by the board and by exporters. Among the more important of these outlets are the Pacific Islands, Honolulu, the Philippines, and Malaya.

Transport

To increase our sales in the markets of the world we must not only have increasing supply and increasing awareness of market requirements, but the transport to carry our product in sufficient quantity when and as required. In the first instance within New Zealand the upsurge in the volume of our meat for export requires enlargement of port and rail facilities, with particular emphasis on the goal of all-weather loading. The board in 1955 placed before the Government a report on urgent and long-term problems. A Government committee investigated and reported on these matters and at many points action has been or is being taken. It is of obvious importance that bottlenecks in the system of transport must not be allowed to impede the flow of our meat to world markets.

It has been one of the principal concerns of the board—indeed one of its central duties—to ensure the orderly flow of meat to overseas destinations. In years past this was almost wholly a matter of getting the meat to the United Kingdom in appropriate quantities at the most suitable times. Since the war we have needed diversification of shipping to carry a larger volume of produce and we have required new services to new markets. Whereas before the war we shipped to 8 ports outside the United Kingdom, today we ship to more than 30. The advent of these improved transport links in the last year or two has been a milestone in the history of our meat trade.

We have a good service to our principal market in the United Kingdom and coverage of the west coast of Europe, the Mediterranean area, and the east coast of North America, both the United States and Canada. The changed pattern of trade has required the introduction of adequate services to the west coast of North America, Honolulu, Japan, and other parts of the Pacific. These services have enabled exporters to exploit opportunities in markets where before, owing to lack of regular and sufficiently frequent sailings, trade was slow to develop and we were at a disadvantage in competing with other exporting nations.

Presentation and Sales Promotion

Equally important as the necessary handling facilities has been to ensure that our meat was presented in the form required in the various markets and that its sale was promoted where desirable by personal representation and advertising.

Bagging and packaging are factors to which further attention is being given. With packaging methods and materials changing rapidly under modern conditions, it has been necessary to ensure that full advantage is taken of new means of getting the meat to market in the best condition. It does not necessarily follow that the New Zealand exporter will become quickly or deeply involved in the trade in pre-cut meat, as many had supposed. The requirements of the numerous markets are not by any means all alike. The great bulk of our sheep meats is likely to continue to leave this country in carcass form for a long time, though the packaging of boneless beef is of course already well developed.

When new markets are being developed, personal contact is highly desirable, in fact essential, if the most is to be made of our opportunities. With this in mind the board has recently appointed a travelling representative, who is able to obtain and pass on to exporters detailed knowledge of the requirements of various markets and of the operation of policies and regulations or restrictions in the various importing countries.

At the same time information is constantly received by New Zealand Government trade commissioners at key points. Their careful appraisal of markets and their attention to detail contribute much to efficient marketing. Their work is of great value to the board and the exporters.

Advertising and Publicity

In the United Kingdom we have built a fine tradition of sales promotion, reaching the housewife first while she is still a child at school, then when she enters domestic science classes, and eventually when she does her buying in the butcher's shop.

In publicity as in all other aspects of our trade it is necessary to keep abreast of a changing market. Accordingly New Zealand lamb is now featured regularly at peak hours on television in Britain, reaching an audience of millions.

The trade reports a marked response to this new medium of advertising our meat. Sales promotion is playing a very important part in our marketing in the United Kingdom. Special campaigns and trade displays are now systematically arranged. Advertising was recently undertaken for our lamb in Sweden and is under consideration at present for various new markets.

Market Information

It is not sufficient that the board and the trade alone should be abreast of changing markets. Farmers themselves need to be informed on the progress of the trade, the trend of supply and price, and the relative demand for the various types of meat they produce. For this purpose a market information service has been set up by the board to present weekly and monthly summaries for publication to the producer by way of newspaper and radio and in full detail through the board's official journal.

There is therefore much information available to the farmer to enable him to adjust his own production and marketing to the market as far as is practicable. It is for the farmer, as far as he can, to keep abreast of current trends through these services.

These considerations bring us back to the farm on which the meat is produced. Here I think it may be of value to refer to certain factors in the farmer's out-turn of his stock. He should use the scientific knowledge available to maintain his livestock husbandry in accord with that knowledge.

He will also be rewarded if he plays disease, particularly hydatids, which is costing the industry about £2¼ million his part in the precautions against pounds annually. He would be well advised to vaccinate against blackleg and pulpy kidney. He should take particular care to guard against bruising of his stock going to the works and he should always strive to present stock in the right condition for slaughter.

These are practical details which should not be overlooked by the farmer wishing to get the maximum return in a market which is indeed a changing one. Above all, the farmer's job is to produce. I do not believe the meat producer should allow himself to be diverted from his constant objective, the maximum possible economic production.

The limits to marketing meat at reasonably good prices have not been reached, despite the many difficulties that arise from time to time. The farmer cannot expect always to have prices wholly in his favour, but I can assure him that his products are the best of their kind in the world today and that a world in need of meat is increasingly aware of this fact. That is the very sound position from which the meat producer may regard his market and its future.

Agricultural and Pastoral Show Dates

THE following are dates and venues of A. and P. shows up to the end of December:

NORTH ISLAND

October

17 and 18 October—Poverty Bay A. and P. at Gisborne.

21, 22, and 23 October—Hawke's Bay A. and P. at Hastings.

November

30, 31 October and 1 November—Waikato A. and P. at Hamilton.

31 October and 1 November—Wairarapa and East Coast P. and A. at Carterton.

5 November—Waikato Central A. and P. at Cambridge.

7 and 8 November—Manawatu and West Coast A. and P. at Palmerston North.

7 and 8 November—Whangarei A. and P. at Whangarei.

8 November—Tokoroa A. and P. at Tokoroa.

8 November—Clevedon A. and P. at Clevedon.

14 and 15 November—Wanganui A. and P. at Wanganui.

15 November—Bay of Islands P. and I. at Waimate North.

15 November—Waihi A. and P. at Waihi.

21 and 22 November—Egmont A. and P. at Hawera.

22 November—Rotorua A. and P. at Rotorua.

27, 28, and 29 November—Auckland A. and P. at Auckland.

28 and 29 November—Stratford A. and P. at Stratford.

December

6 December—Helensville A. and P. at Helensville.

6 December—Kaikohe A., P., and H. at Kaikohe.

6 December—Hauraki A. and P. at Paeroa.

SOUTH ISLAND

October

18 October—Ellesmere A. and P. at Leeston.

25 October—Northern A. and P. at Rangiora.

November

1 November—Amberley A. and P. at Amberley.

7 and 8 November—Marlborough A. and P. at Blenheim.

12, 13, and 14 November—Canterbury A. and P. at Christchurch.

15 November—West Otago A. and P. at Kelso.

15 November—Taieri A. and P. at Outram.

19 November—North Otago A. and P. at Oamaru.

21 and 22 November—Nelson A. and P. at Richmond.

22 November—Waimate A. and P. at Waimate.

22 November—South Otago A. and P. at Balclutha.

22 November—Courtenay A. and P. at Kirwee.

29 November—Tokomairiro A. and P. at Milton.

Main Wool Sales

The dates and venues of main wool sales until the end of December are:

22 and 24 October: Dunedin.

30 October and 1 November: Christchurch.

10 November: Auckland.

14 November: Wanganui.

19 and 21 November: Napier.

26 November: Wellington.

5 December: Christchurch.

10 December: Invercargill.

15 December: Dunedin.

19 December: Timaru.

Importance of Checking Hives Early in the Season

By D. A. BRISCOE,
Apiary Instructor,
Department of Agriculture,
Tauranga

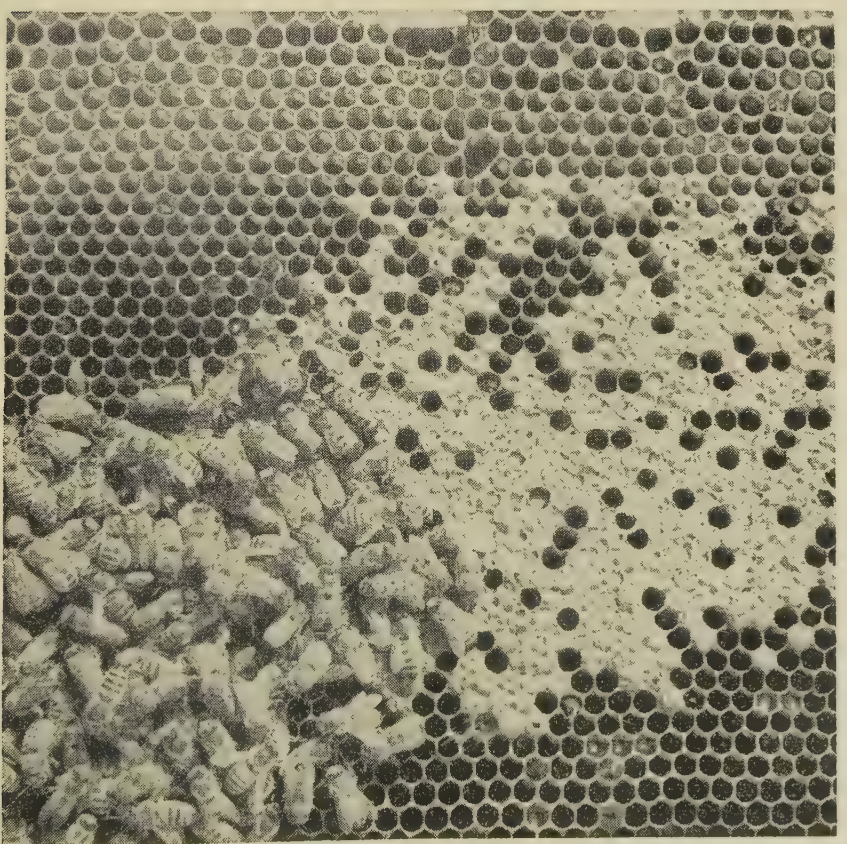
Seasonal Notes for the Domestic Beekeeper

DURING October it is very important that domestic apiaries be given a detailed examination to ascertain the condition of each hive. For preference a fine, sunny day should be chosen to carry out this work, and under such conditions it is advisable to use only sufficient smoke to allow comfortable handling of the bees. Too much smoke will tend to over-excite the bees and this can cause unpleasant working conditions.

AFTER the bees at the entrance to the hive have been driven back with a little smoke removal of the cover and inspection of the interior can proceed. Remember that erratic and jerky movements have an infuriating effect on the bees. Endeavour to make movements smooth and deliberate without unnecessary jarring of the hive during manipulations.

It is a good idea to remove the lid and place it upside down in front of the hive. As subsequent supers or frames are taken from the hive they can be placed in the lid until the colony is reassembled. This method will prevent any honey and wax from being spilt on the ground surrounding the colony and is a means of preventing robbing from starting in an apiary. Another important point in favour of this practice is that should disease be found in a colony, there is little risk of spreading the infection to other hives in the apiary by honey being left lying about on the grass when the examination is completed.

The tops of the frames in the supers should be scraped clean of wax and burr comb and they can then be removed one at a time and examined. Wax and burr comb should not be left lying about, but should be collected in a tin or bucket and later melted down for the wax they contain.



A comb of bees and brood short of stores and on the point of starvation early in the season. Uncapped brood cells and torn cappings are typical starvation symptoms.

Stores

At this time of the year about 25 lb. of honey will be required to meet normal hive requirements until sufficient nectar becomes available in the field. The domestic beekeeper must realise that once brood rearing is undertaken in the hive in earnest reserve stocks of honey and pollen diminish very rapidly.

As a general guide allow one complete frame of honey for the production of the equivalent of brood. It is essential to keep a close watch on the condition of the hive; artificial feeding must be resorted to if the colony becomes low in stores.

Feeding

If the beekeeper has had sufficient foresight, he will have held some combs of honey for feeding. These can be placed in the hive as required. Most domestic beekeepers, however, have no such surplus and therefore must resort to artificial feeding with a 50-50 sugar and water syrup.

This can be fed in several ways, but perhaps the simplest method is to use an ordinary 5 lb. honey tin with a press-in lid. Several small holes are punched in the lid and the tin is filled with the syrup and then inverted over the frames of the brood nest. The use of an additional (empty) super is necessary when reassembling the hive when this type of feeder is being used. To prevent robbing care should be taken to ensure that no syrup is spilt round the hive and that the bees are not given more syrup than can be taken up in the one night. It is advisable to carry out this feeding in the evening, if possible.

Shortage of pollen occurs at times in some places and can cause colonies to be backward. The beginner may have difficulty in diagnosing a pollen deficiency in a hive and should not assume that this is the cause of colonies being a little slow in building up. It is advisable to check pollen as well as honey supplies during early examination of hives. The pollen may be found round the edges of the brood (usually between the brood proper and the supplies of honey) and

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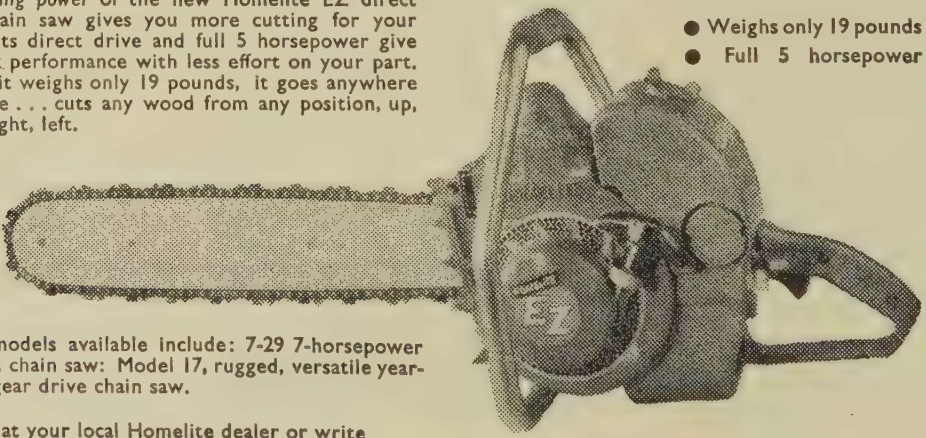

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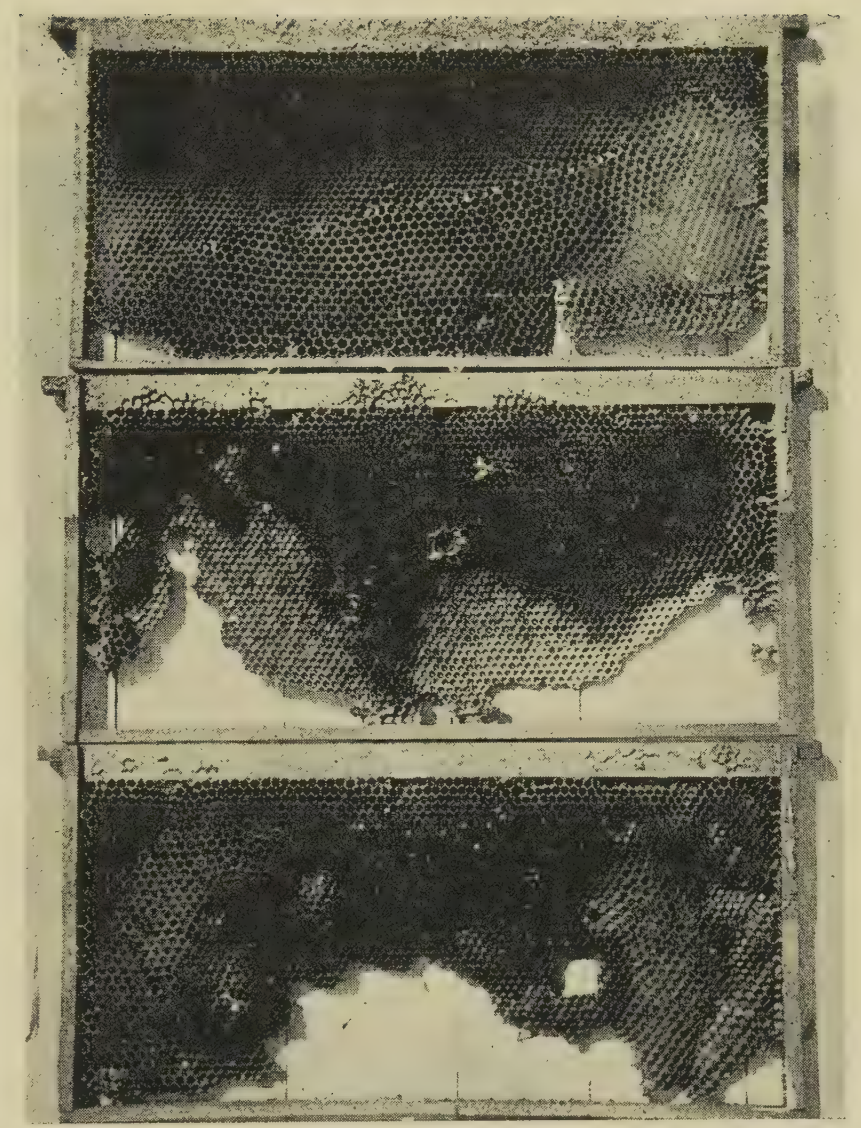
in the combs on the outside of the brood nest.

If a hive is slow in building up and has plenty of honey stores, a known young queen, and no apparent cells of pollen adjacent to the brood nest, or any signs of disease, pollen deficiency may be suspected. In this case it would be advisable to obtain details about feeding a pollen supplement from the Apiary Instructor for the district.

Brood

Patchy brood found during the examination may indicate either a poor queen, shortage of stores (honey and pollen) or disease (American foul brood). If disease is suspected, the hive should be closed up immediately and the Apiary Instructor informed. If the instructor cannot make an early visit, a sample of the infected brood should be posted in a tin to him for positive identification. To leave the matter until later in the season and hope for the best is dangerous.

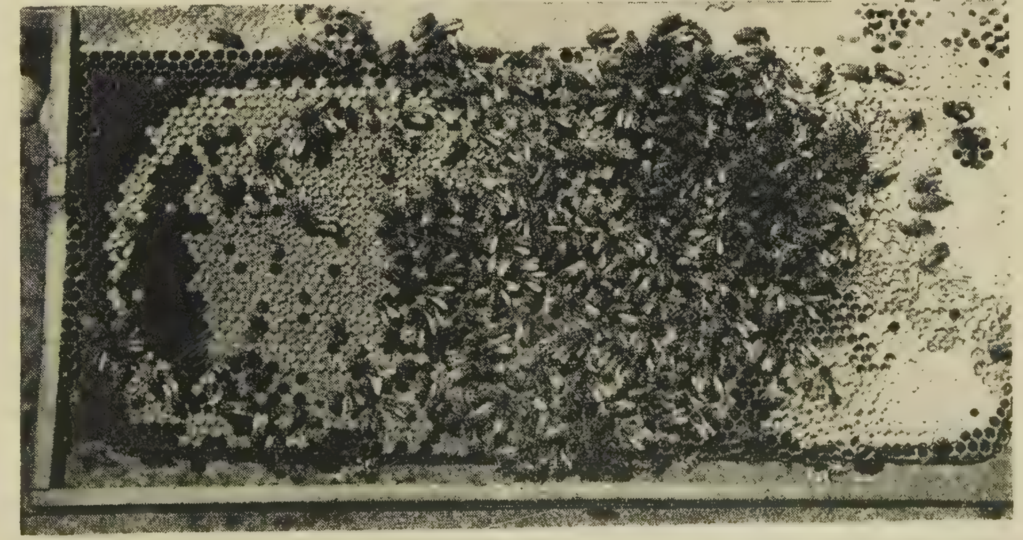
Inferior and damaged combs → that should be removed from a hive during spring examination. The cells in the lower half of the top comb are drone cells.



In the early stages of infection with American foul brood a larva assumes an unnatural position in the cell and then gradually flattens out in the cell with its tail turned slightly up and head lying flat. The dead matter is at first slightly viscid, later becomes ropy, and finally reduces to a scale which sticks hard to the bottom of the cell. The dead matter as it decomposes has a strong smell somewhat resembling that of hot glue.

With the pupa, decomposition is the same except that the tongue appears as

A comb showing a good patch of brood (left) and honey supplies (right). This is typical of what should be found during an early spring examination. →



CHECKING HIVES

Cleaning refuse from a bottom board early in the season.

a fine thread pointing toward the top of the cell. This characteristic is manifest only in American foul brood.

Cappings of brood affected by American foul brood become dark, greasy, and sunken with sometimes a small pinhole in the centre of the capping.

A simple test for this disease is to remove the cap from an infected cell and probe the dead matter with a match or straw, which should be given a slight twist and then slowly withdrawn from the cell. If part of the contents of the cell adheres to the stick and ropes out some distance (½ in. or more), it is fairly conclusive evidence of the disease.

Combs

Spring affords an excellent opportunity of culling out old or poor combs, as at this time of the year the bees' activities cover only a small portion of the hive. Combs with a large amount of drone cells or thick combs with pieces broken away are of little value for use either in the brood nest or for the storage of honey. They should be removed and replaced with correctly drawn combs or frames containing sheets of foundation. These old combs should not be destroyed, but saved to be melted down, perhaps during the dormant period of the year, for the valuable beeswax they contain.

When all the brood combs have been thoroughly examined and the supers removed on to the lid, the bottom board should be cleaned of all accumulated material. During winter a considerable amount of rubbish collects and clearing it away in spring represents a huge task for the bees. It is a simple matter for the beekeeper to remove the rubbish with a flat scraper or hive tool.

The bottom board should be put back into position off the ground on a firm stand. Four bricks make quite a suitable and firm foundation. This allows the air to pass under the hive, thus keeping the bottom board dry all the time. A slight tilt to the front prevents any water running into the hive and accumulating at the back of the bottom board. Any excess growth of vegetation in the vicinity of the hive should be trimmed back. The hive can then be reassembled. Wet or worn hive mats should be replaced at this time with good ones.

Photographs by Rendells.

Radio Broadcasts for Farmers

RADIO broadcasts for farmers will be given during October as follows:

1YA Auckland, 7.45 p.m.

1 October—"Growing Crops for Pigs", by G. B. Haddow, Instructor in Agriculture, Department of Agriculture, Auckland.

8 and 22 October—Talks by officers of Animal Industry Division, Department of Agriculture, Auckland.

15 October—"Silage", by J. E. Bell, Fields Superintendent, Department of Agriculture, Auckland.

29 October—"Gorse, Blackberry, and Rush Destruction", by C. M. Blick, Fields Instructor, Department of Agriculture, Warkworth.

1XH Hamilton, 12.33 p.m.

13 October—"Blood Poisoning in Sheep", by D. Bilkey, Livestock Instructor, Department of Agriculture, Hamilton.

20 October—"Grading of Milk and Cream", by R. J. Preston, Dairy Instructor and Grader, Department of Agriculture, Hamilton.

1YZ Rotorua, 7.15 p.m.

1 October—"Grading of Milk and Cream", by R. J. Preston, Dairy Instructor and Grader, Department of Agriculture, Hamilton.

15 October—"Young Farmers' Clubs", by Matamata Y.F.C. district committee.

29 October—"Cropping for Summer and Winter Production", by S. R. Hewitt, Instructor in Agriculture, Department of Agriculture, Whakatane.

2XG Gisborne, 8 p.m.

14 October—"For the Poverty Bay Orchardist", by J. D. Overbye, Horticultural Instructor, Department of Agriculture, Gisborne.

2XA Wanganui, 8 p.m.

2 October—"Canadian Newsletter", by Mary MacDonald.

9 October—"The Radio Vet.", by S. Jamieson, Veterinarian, Department of Agriculture, Wanganui.

16 October—"The Grass-grub Problem", by G. R. Moss, Instructor in Agriculture, Department of Agriculture, Wanganui.

23 October—"Seasonal Livestock Notes", by J. F. Munting, Livestock Instructor, Department of Agriculture, Wanganui.

30 October—"Potato Pests and Diseases", by A. K. Booth, Instructor in Agriculture, Department of Agriculture, Wanganui.

2YZ Napier, 7.10 p.m.

7 October—"Irrigation", by G. M. Bennett, Instructor in Agriculture, Department of Agriculture, Hastings.

21 October—"Causes and Prevention of Rejection of Pigs at Works", by F. D. Usher, Supervising Meat Inspector, Department of Agriculture, Hastings.

2ZA Palmerston North, 12.33 p.m.

13 October—"Some Notifiable Diseases of Stock", by H. O. Mackley, Livestock Instructor, Department of Agriculture, Feilding.

20 October—"Responsibilities of Mechanical Farming", by R. Burton, Farm Machinery Instructor, Department of Agriculture, Palmerston North.

31 October (8.45 p.m.)—"Growing Strawberry Plants", by G. N. Paulin, Horticultural Instructor, Department of Agriculture, Palmerston North.

3YA Christchurch, 12.20 p.m.

6 October—"The Menace of Nassella Tussock", by W. Leonard, Weed Research Officer, Department of Agriculture, Christchurch.

20 October—Review of "The New Zealand Journal of Agriculture", by E. G. Smith, Instructor in Agriculture, Department of Agriculture, Rangiora.

4YA Dunedin and 4YZ Invercargill, 12.33 p.m.

6 October—"Care of the Growing Lamb", by R. Stuart, Livestock Instructor, Department of Agriculture, Ranfurly.

13 October—"Pasture Management", by J. R. Thomson, Instructor in Agriculture, Department of Agriculture, Invercargill.

20 October—"Farming Sidelines", by R. C. Schofield, Instructor in Agriculture, Department of Agriculture, Alexandra.

Regular Sessions

1XH Hamilton, Mondays at 12.33 p.m. and Tuesdays at 8 p.m. (Frankton stock market report), Wednesdays at 12.33 p.m. (report from Ruakura Animal Research Station), Thursdays at 12.33 p.m., Fridays at 8 p.m. (stock sale review).

1XN Whangarei, Mondays at 8 p.m. (Northland livestock report and "Farming for Profit"), Wednesdays at 8 p.m. ("Farming for Profit"), and Fridays at 8 p.m. ("News for the Farmer").

1YA Auckland, Mondays at 12.33 p.m., Tuesdays, Wednesdays, and Thursdays at 7.45 p.m., and Fridays at 6 p.m. and 7.45 p.m.

1YZ Rotorua, Mondays at 12.33 p.m. (Waikato stock market review), Tuesdays at 7 p.m. (Hamilton stock market report), Wednesdays at 7.15 p.m. (Pig Council talk on fourth Wednesday of every other month at 12.33 p.m.), Thursdays at 12.33 p.m.

2XA Wanganui, Wednesdays at 8 p.m. (Wanganui stock sale report), Thursdays at 8 p.m.

2XG Gisborne, Tuesdays at 8 p.m., Fridays at 8.2 p.m. (Gisborne stock market report).

2XN Nelson, Thursdays at 8 p.m.

2XP New Plymouth, Thursdays at 8.1 p.m.

2YA Wellington, Mondays at 7.15 p.m., Thursdays at 12.33 p.m., Fridays at 7 p.m. (Feilding stock market report).

2YZ Napier, Tuesdays at 12.12 p.m. (Hawke's Bay orchardist session), Tuesdays at 7.10 p.m., Wednesdays at 7.15 p.m. (Hawke's Bay-Poverty Bay livestock market report), Thursdays at 12.33 p.m.

2ZA Palmerston North, Mondays at 12.33 p.m., Fridays at 8.45 p.m. (Feilding stock market report).

3XC Timaru, Mondays at 8 p.m. (Pleasant Point stock market report), Tuesdays (fortnightly) at 8 p.m. (Temuka stock market report), Wednesdays at 8 p.m., and Saturdays at 10.30 a.m.

3YA Christchurch, Mondays at 12.20 p.m., Wednesdays at 7.15 p.m. (Addington stock market report), Thursdays at 12.33 p.m. and 7.15 p.m.

3YZ Greymouth, Mondays and Thursdays at 12.33 p.m.

4YA Dunedin, Mondays at 12.33 p.m., Tuesdays at 12.33 p.m., Wednesdays at 12.33 p.m. and 6.50 p.m. (Burnside stock market report), Thursdays at 12.33 p.m.

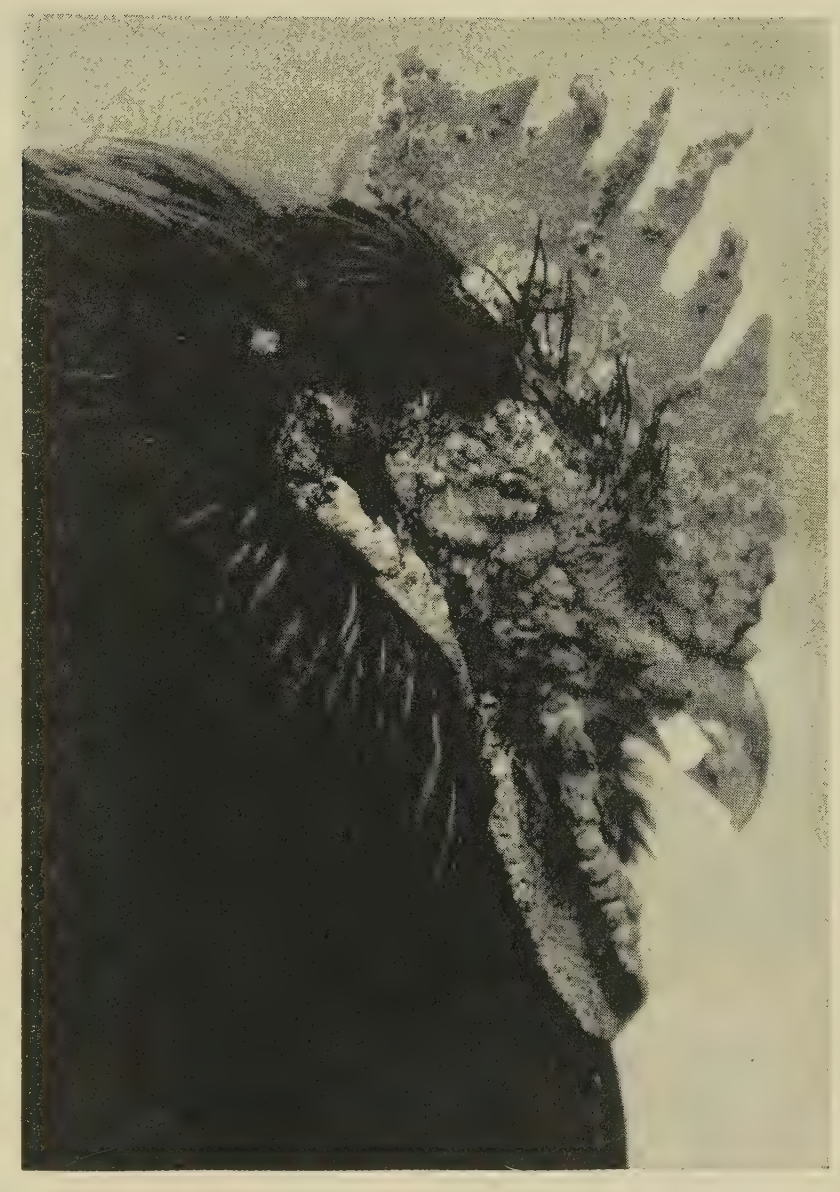
4YZ Invercargill, Mondays at 12.33 p.m., Tuesdays at 12.33 p.m. and 7.15 p.m. (Lorneville and Gore stock market reports), Wednesdays at 12.33 p.m., and Thursdays at 12.33 p.m.

Fowl Pox

By R. M. SALISBURY,
Chief Diagnostic Officer,
Department of Agriculture
Animal Research Station,
Wallaceville

FOWL pox is a well known disease of poultry in the majority of districts of the North Island, but has been strictly limited in the South Island. Last autumn a serious outbreak in the Manawatu-Horowhenua area caused considerable loss. Birds died, production was markedly reduced, and the recovery period was prolonged.

THE disease was first reported in the area in late March and within a few weeks about 50 properties were involved within a radius of 20 miles of the original outbreak. No explanation can be offered why the disease spread so rapidly, but perhaps if farmers have up-to-date information about the disease, they may be able to prevent a recurrence.



A cockerel with severe natural infection.

Cause and Symptoms

Fowl pox is caused by a virus which has an affinity for the skin and which enters the body through small abrasions in the skin. It first produces a blister or vesicle which progresses to a pustule; after this ruptures a scab forms. If the scabs are lifted, a raw, bleeding surface is left. This is the common form of the disease, but infection of the eye and throat can also occur and may be termed "roup" by the farmer.

Fowl pox does not cause many deaths, and those which do occur result from the formation at the entrance to the windpipe of a cheesy plug which makes breathing difficult and can suffocate the bird.

In any affected flock birds would show all types of infection; that is, scabs on the comb, wattles, corners of the mouth, and edge of the beak, swollen watery eyes, and gasping for breath.

Breeds with large combs are usually more severely infected. Cockerels are particularly susceptible because of their large combs and because their fighting provides wounds for the entry of the virus.

In New Zealand the disease almost invariably occurs in autumn and early winter, which is unfortunate for two reasons:

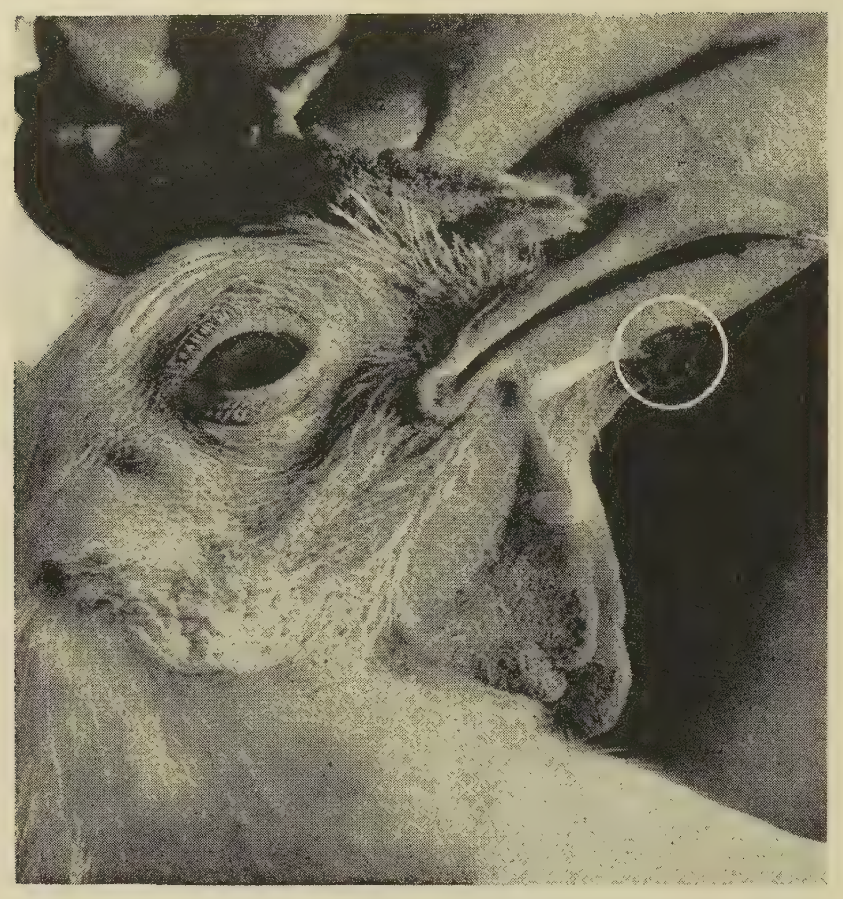
1. Outbreaks often coincide with the period of high egg prices and also when eggs are required for hatching.
2. Infection of male birds has an adverse effect on fertility.

Preventive Methods

The virus is very hardy and will, under dry conditions, survive for a very long time, probably years. Thus, a shed with virus particles lodged in cracks in it may remain potentially infective. The virus, fortunately, is susceptible to moist heat, and farmers with sheds which have contained infected birds during autumn and which will be used for the brooding of chicks in the next rearing season should:

(a) Remove all litter from the property, brush the floors, walls, and ceilings to remove all dirt, cobwebs, etc., and then thoroughly hose them.

(b) Then scrub the walls, floors, etc., with a hot caustic solution such as 2 per cent caustic soda or



A pullet with very few pox lesions. One can be seen on the base of the beak (in circle).

caustic potash; that is, 2 lb. of caustic soda or caustic potash to 10 gallons of water. (If caustic soda or potash is not available, a strong, hot solution of washing soda would be satisfactory.) Care should be taken to protect the hands when this solution is being used.

In experiments the virus has stood ordinary fumigation with formalin in an incubator for up to 50 minutes, but was killed after 90 minutes.

Vaccination

If fowl pox appears on a property, the following action should be taken:

1. Consult the local Poultry Instructor for verification of the disease. The scab formation is very typical and a reasonably accurate diagnosis can be made on the spot and confirmed later by laboratory examination.
2. Vaccinate all in-contact birds immediately with pigeon pox vaccine. This actually means all birds, because if contact is not direct, the infection can be carried on boots and utensils from pen to pen. The method of vaccination has been described in previous "Journal" articles and full instructions for its use are enclosed with the vaccine.
3. Destroy the most severely affected birds. Under no conditions should such birds be sold off the property.

If the disease is recognised early in an outbreak and birds are vaccinated immediately, it should be brought under control within 3 to 4 weeks and there should be no appreciable drop in egg production. If, however, the disease has been active for some time before remedial measures are adopted, the recovery period may be protracted. Infected birds are highly susceptible to other disease conditions such as coccidiosis and leucosis and may be out of production for some time.

As stated before, once fowl pox has appeared the farm is always potentially infected, and in the following season precautionary measures must be adopted as follows:

1. Vaccination of day-old chickens with day-old pigeon pox vaccine, followed by vaccination with fowl pox vaccine at 14 to 15 weeks. This procedure should be adopted only where fowl pox has been experienced during the brooding stages. Infection at this stage is comparatively uncommon and this method should be considered only under special circumstances.
2. **Vaccination with fowl pox vaccine at 8 to 12 weeks.**

The immunity conferred by pigeon pox vaccine either to chickens or adults is not permanent and birds are again susceptible after 3 months. The immunity following fowl pox vaccination is lifelong and birds done as chicks will be immune for life.

Precautions necessary when fowl pox vaccine is used are as follows:

1. The vaccine can be bought only on the authority of a Poultry Instructor.
2. Only birds in good condition should be vaccinated. Birds should be well grown and worm free; that is they should have been treated within the previous 2 weeks with carbon-tetrachloride.
3. Birds should **not** be vaccinated and dewormed at the same time.
4. Only birds between the ages of 8 to 12 weeks should be vaccinated. The vaccine must not be used on day-old chicks or adult birds.
5. Birds should be maintained on an adequate, high-protein growing ration.
6. As vaccinated birds carry the virus for 3 weeks after vaccination, they should not be sold off the property during this period. Vaccinated birds should not be mixed with unvaccinated.
7. The vaccine causes a systemic reaction in the birds about 17 to 21 days after vaccination, and they should be carefully watched and cared for at this stage.

The vaccine has been criticised in the Auckland area as being too severe. These complaints are being investigated. In all other districts it has given very satisfactory results and farmers would be well advised to continue vaccination and pay particular attention to the points enumerated above.

As mentioned earlier, no explanation can be given for the rapid spread of the disease in the recent outbreak. The virus can be transmitted by biting insects such as mosquitoes and red mites, but it is believed these play only a minor role in New Zealand. The virus is more likely to be spread by egg crates, poultry crates, and feed bays and by visits from poultry farmer friends. Every effort should be made to prevent the mechanical spread of the virus from one farm to another.

Three-year-old orange trees in a commercial orchard. The greatest scope for development in the citrus industry seems to lie in the production of oranges and mandarins, as present yields are only 3 per cent of requirements and lemon and grapefruit production is sufficient for local demand.

Citrus Production in 1957

By W. A. FLETCHER,
Citriculturist, Department of Agriculture, Auckland

IT is estimated that there are now more than 155,000 citrus trees planted in commercial orchards throughout the Dominion. Lemons and grapefruit comprise more than two-thirds of this total and oranges and mandarins the remainder. Lemon trees predominate in the Bay of Plenty, grapefruit round Auckland, and sweet oranges and mandarins at Kerikeri. Gisborne is a smaller citrus-growing district than the others, with about 10 per cent of the Dominion total of citrus trees, mainly oranges and lemons.

THE exceptionally wet winter and spring of 1956 adversely affected the setting of the 1957 crop of citrus fruits, especially at Auckland and Kerikeri, and resulted in reduced production from these districts. Grapefruit crops were worst affected and were markedly reduced in Auckland, where little more than half of a normal crop was harvested. Heavy frosts in June and July in all districts caused losses of fruit, especially lemons, but losses were not serious. There was also some injury to trees and a few newly planted trees were killed.

Despite frost losses the production of lemons was substantially greater than in the previous year because of increasing yields from the large number of young trees coming into heavier bearing in the Bay of Plenty and at Gisborne.

Reduced production of grapefruit resulted in a better balance between supply and demand and prices for these fruits were better than for some years.

Though the spring of 1957 was cool and spring growth was retarded, a very good setting of all citrus fruits appears to have been obtained for the coming season. The trees stood up very well to dry conditions from November 1957 until February 1958 and fruit drop was only slight. Good crops are showing on most trees, and with with many young trees coming into bearing yields of all citrus are expected to be good for the 1958 season.

ESTIMATED PRODUCTION OF CITRUS FRUITS DURING THE 1957-58 SEASON IN STANDARD CASES (APPROXIMATELY 40 LB. NET)

Kind	Kerikeri	Auckland	Bay of Plenty	Gisborne	Total
Standard lemons ..	3,100	7,000	63,100	11,000	84,200
Meyer lemons ..	8,000	1,100	7,100	5,200	21,400
Total lemons ..	11,100	8,100	70,200	16,200	105,600
N.Z. grapefruit ..	12,000	35,000	37,000	1,700	85,700
Wheeny grapefruit ..	3,000	1,600	1,000	700	6,300
Total grapefruit ..	15,000	36,600	38,000	2,400	92,000
Sweet oranges ..	6,000	900	3,000	3,000	12,900
Mandarins	1,000	1,000	800	100	2,900
Other citrus	200	500	—	—	700
Total citrus ..	33,300	47,100	112,000	21,700	214,100

Planting Trends

Citrus plantings continue to increase in all districts except Auckland, where the steady decline in the citrus industry apparent over the past decade was maintained in 1957.

New plantings in 1957 were the highest recorded since 1951, and though there is still a shortage of nursery citrus trees, there are signs that the supply is improving.

There is a very strong trend toward planting oranges and mandarins and almost 90 per cent of the 7,200 trees planted out in 1957 were of these kinds. Standard lemons are still being planted in the Bay of Plenty and at Gisborne, but these are insufficient to replace trees being removed for old age and subdivision of land. Very few Meyer lemon or grapefruit trees are being planted.

About 3,900 trees were removed from citrus orchards during the year, and following the trend of the past few years these were mainly lemon and grapefruit trees with greatest losses in the Auckland district. Urban expansion was responsible for some losses in Auckland and the Bay of Plenty, but old age and neglect account for many of the removals, especially of lemon trees.

Increases and decreases in the numbers of citrus trees recorded during 1957 are tabulated below according to districts and kinds of citrus.

NEW CITRUS TREES PLANTED DURING 1957

	Kerikeri	Auckland	Bay of Plenty	Gisborne	Total
Standard lemons ..	—	—	250	330	580
Meyer lemons ..	—	—	—	80	80
N.Z. grapefruit ..	—	20	90	—	110
Wheeny grapefruit	—	—	—	—	—
Sweet oranges ..	2,160	140	720	320	3,340
Mandarins	1,360	160	1,500	—	3,020
Tangelos	50	—	—	—	50
Totals	3,570	320	2,560	730	7,180

CITRUS TREES REMOVED DURING 1957

	Kerikeri	Auckland	Bay of Plenty	Gisborne	Total
Standard lemons ..	70	1,460	270	260	2,060
Meyer lemons ..	—	100	230	10	340
N.Z. grapefruit ..	—	750	150	—	900
Wheeny grapefruit ..	—	—	130	20	150
Sweet oranges ..	—	10	70	260	340
Mandarins	—	—	30	—	30
Tangelos	40	—	—	—	40
Totals	110	2,320	880	550	3,860

Future Production

A further survey of the fruitgrowing industry of New Zealand is being carried out by the Department of Agriculture this year. Data obtained will bring up to date information on production trends. However, present records indicate production trends for each kind of fruit as given below.

Grapefruit

There appears to have been a decline of about 6 per cent in the total number of grapefruit trees since 1953, the losses being almost entirely in the Auckland district. The 1953 survey revealed a high proportion of young trees in the 0 to 10 years age group and indicated that a considerable increase in grapefruit could be expected. Annual production estimates over the past few years, however, give the impression that production is declining. Accurate estimating of the grapefruit crop is very difficult and it is considered likely that these production estimates have been too low. There is no doubt that production of grapefruit is still more than adequate to satisfy the New Zealand market, but crops do not seem to have yet increased to a level that was to be expected. Adverse weather, especially in Auckland, undoubtedly reduced crops, especially last season, and low prices have resulted in some neglect in many grapefruit blocks which has probably also lowered their production potential.

Standard Lemons

There was an appreciable increase in the production of standard lemons last season, and as many young trees come into heavier bearing it is expected that the upward trend will continue until a level of about 100,000 bushels is reached within the next 5 years or so. Since 1953, however, there has been a marked falling off in the rate of planting of lemon trees to replace those being lost from old age, and unless the present planting rate of about 600 to 700 trees per year is trebled, production is likely to decline again after about 1962.

Meyer Lemons

A large proportion of the Meyer lemon trees are young and capable of bearing increasing crops. However, as many of the trees are interplanted with other citrus trees and the intention is to crop them for a limited period only, a potential yield of about 40,000 bushels of these fruits indicated by present tree numbers will probably never be reached. Already since 1953 there has been a 6 per cent decrease in the total number of Meyer lemon trees. Production of Meyer lemons last season was about 3,000 bushels less than in the previous year, but this was probably only a fluctuation due to adverse weather, especially in the Kerikeri crops. Yields of Meyer lemons are expected to remain around at least 25,000 bushels for several years.

Oranges and Mandarins

Whereas lemon and grapefruit production in New Zealand is now sufficient to satisfy local demand during the season, present yields of oranges and mandarins are less than 3 per cent of market requirements. Obviously, therefore, the greatest scope for development of the citrus industry in New Zealand lies with oranges and mandarins. These fruits have been grown in New Zealand for many years, but they require hot summers as well as mild winters to obtain highest quality and there is no doubt that New Zealand's climate is marginal for their successful production.

Yields and eating quality of fruit from the earlier orange plantings have often been disappointing and this has largely discouraged any serious attempt to capture the local market for these fruits. In recent years, however, evidence has been obtained that certain selections, especially when propagated on the hardy *Poncirus trifoliata* rootstock, are better adapted to the climate and produce good crops of a quality superior to the older plantings. As a result orange plantings have increased by more than 30 per cent to a total of more than 40,000 trees over the last few years, and mandarins have increased 120 per cent to almost 12,000 trees.

As long as the present favourable prices for these fruits are maintained it seems likely that this planting trend will continue, and even with trees already planted yields of oranges and mandarins should increase to 50,000 or more bushels within the next 5 to 10 years.

Provided this fruit meets with consumer approval, the quantities expected should be easily absorbed by the local market. As more fruit from the newer plantings becomes available it is vital for the future success of the industry to establish consumer confidence that only fruit of uniformly good quality is marketed. This will require not only good orchard practice but also very careful grading and processing of the harvested fruits. Not all the trees planted in recent years will produce fruit with quality up to a desirable standard and those below standard should not be allowed to prejudice the success of the better types.

As production increases, market prices for these fruits will almost certainly not continue at their present high level, and on many very small orchards it may become difficult to produce fruit economically. It is pleasing to observe, however, that some growers are endeavouring to build up larger orchard units.

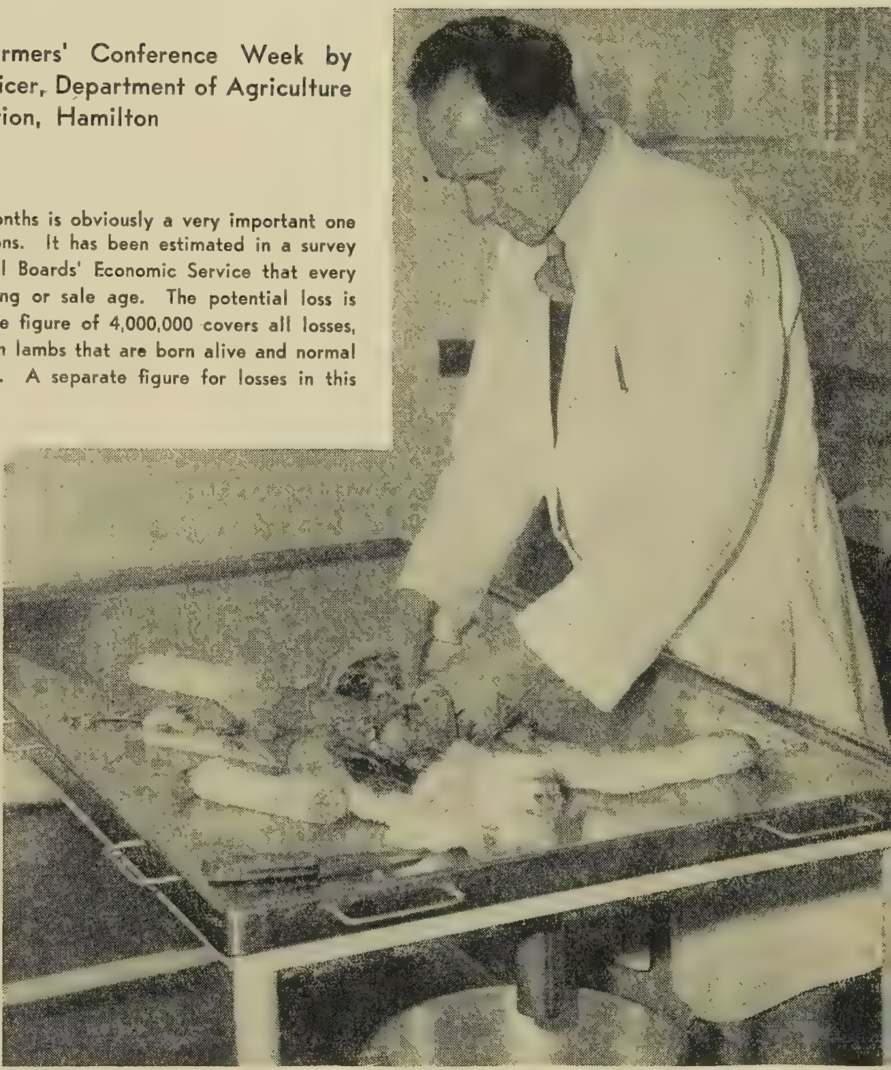
Research into types of orange and mandarin best suited to New Zealand conditions is continuing, but there is much to be learnt. Several promising variety and rootstock combinations are under observation, and growers can assist the future development of their industry very considerably by planting out a few experimental trees of these types, but they should refrain from planting large blocks of such trees until more information is available.

Undoubtedly many production and marketing problems still require solution before commercial orange and mandarin growing can become successfully established on a large scale in New Zealand, and it is emphasised that in the meantime further development should be continued with caution.

Lamb Losses from Birth to 6 Months

A paper given at the Ruakura Farmers' Conference Week by
D. C. DODD, Veterinary Diagnostic Officer, Department of Agriculture
Animal Research Station, Hamilton

THE period in a lamb's life from birth to 6 months is obviously a very important one from both economic and health considerations. It has been estimated in a survey conducted by the New Zealand Meat and Wool Boards' Economic Service that every year about 4,000,000 lambs fail to reach weaning or sale age. The potential loss is therefore about £10,000,000 to £12,000,000. The figure of 4,000,000 covers all losses, but I intend to deal only with losses that occur in lambs that are born alive and normal and absolutely free from any infectious disease. A separate figure for losses in this group is not available.



Mr Dodd conducting a post-mortem examination at the Ruakura Diagnostic Centre, which was established in 1955. The aim is efficient and fast handling of specimens and reporting of results to veterinary surgeons who submitted the specimens.

THE causes of lamb losses vary greatly. Some are accidental, some are preventable, some are curable, and some are incurable. The ones which we can prevent or cure are the ones which we are going to talk about.

Before getting on to specific diseases let us consider firstly why, if a lamb is born perfectly healthy, so many become infected with disease producing organisms, and how these organisms get into the body. The most important diseases occur as the result of either wound infection or of infectious bacteria being taken in through the mouth. The first wound which all lambs must sustain is the rupture of the navel cord, so that within minutes of being born the cord becomes contaminated with bacteria and there is danger of infection with a disease producing variety. This brings us, then, to the first group of diseases, known as navel infection.

When the navel cord is still moist and contains the freshly clotted blood it provides an ideal place for bacteria to grow. In order to minimise this danger the cord normally dries very quickly and ceases within a day or two except under wet conditions to become a means of entry for bacteria. Broadly, two different types of infection occur: the first causes rapid death from blood poisoning within the first few days and the other a slower death in one or two weeks (but sometimes longer) by forming abscesses at the navel and in various organs, especially the liver and lungs.

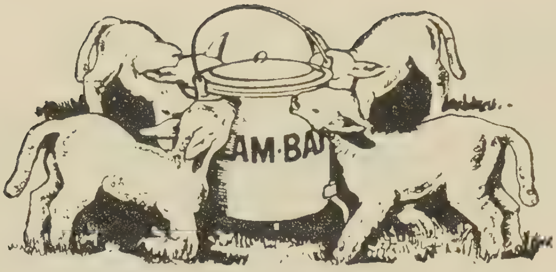
Most lambs with the blood poisoning type are found dead and can quite easily be picked by their appearance; they putrefy and blow up rapidly, the belly is swollen, and the skin of the belly and inside the thighs has a bluish appearance. When you open them, you find under the skin around the navel a layer of dark reddish bloodstained gelatinous material; inside the abdomen all the organs have a similar dark red appearance and there is usually much dark bloodstained fluid in the abdomen and in the sac around the heart.

The organisms which cause this type of infection belong to the clostridial group; they are always present in the soil and commonly infect wounds, causing blood poisoning or, more specifically, blackleg, malignant oedema, and tetanus.

Owing to the rapidity of death in these cases of navel infection treatment is usually too late, but I believe that it is always worth trying an injection of penicillin. Even if you were to save only one in ten, you would more than recover the cost of the penicillin.

As treatment is unlikely to be successful, it is fortunate that we can prevent this disease by vaccination of the ewes 3 weeks before lambing. There is no need for me to go into the details of this. The problem can be discussed with your veterinary surgeon or Livestock Instructor. As these blood poisoning organisms are always present in the soil, it is important that you lamb your ewes on well grassed paddocks away from the sheep yards and places where sheep tend to camp; such places are always a greater source of infection than "clean" paddocks.

The things to remember about this type of navel infection are (1) that it is the most common, (2) that it affects lambs less than a week old, and (3)



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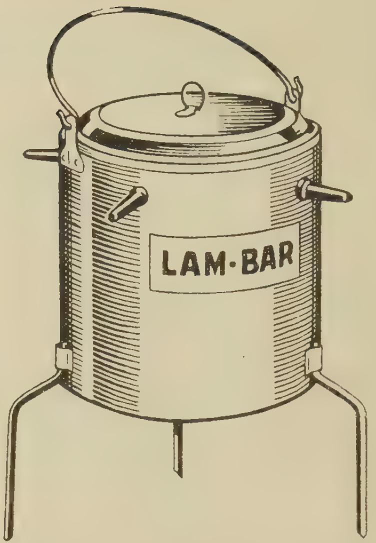

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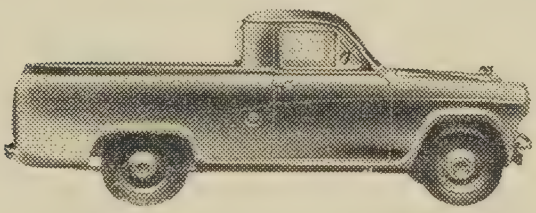

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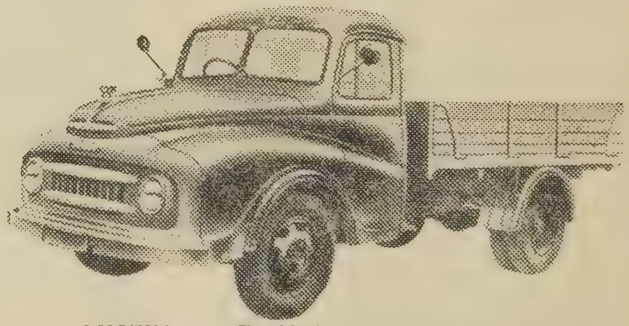

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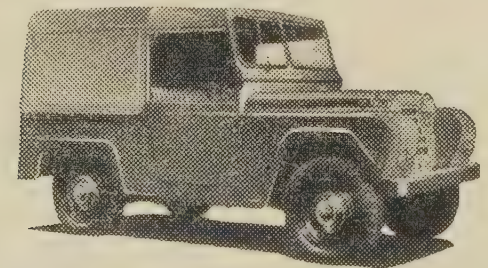

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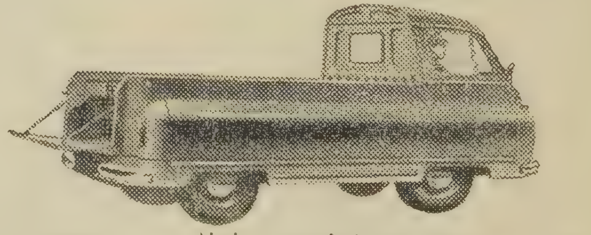

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that it can be prevented by vaccination of ewes before lambing.

The other types of navel infection are less common and cannot be prevented by vaccination. When pus forming bacteria enter the navel cord they usually form a local abscess just inside the body and then spread to the liver and often the lungs and joints; in the liver and lungs there may be dozens of small abscesses. Lambs affected with these organisms usually die at one to three weeks, but some live longer and a few even thrive and are eventually killed as fat lambs. Only then are the signs of infection (multiple liver abscesses) found. Treatment of lambs with this type of infection with penicillin is most unlikely to be successful, so that losses from this cause simply have to be written off as a natural hazard.

Post-marking Infections

The next wounds which all lambs must suffer are those that occur at marking time; the same type of organisms that infect the navel cord infect marking wounds. There are a number of different methods of marking lambs, but I do not intend to enter into an argument on which is the best. There are champions for each method, and my advice is to stick to the one you like best.

It is as well to remember, however, that all of these methods cause wounds through which bacteria can enter the body. Again we have the clostridial type which causes blackleg and malignant oedema (blood poisoning) and another member of the same group which causes tetanus.

The same remarks, as far as treatment and prevention of blood poisoning are concerned, apply here. Some can be saved by penicillin, while those from ewes which have been vaccinated will still have a fair degree of protection.

With regard to tetanus I think it fair to say that the use of rubber rings does seem to favour the development of this disease; only occasionally does it become a problem. Though tetanus is easily prevented, it is notoriously difficult to cure. Occasionally success may be obtained by the use of penicillin and tetanus antiserum, but generally it is a waste of time and money.

If you use the knife for marking your lambs, there is little danger of infection with blackleg or tetanus organisms because the wounds are large, well drained, and open to the air. Pus forming and certain other organisms can, however, still gain entry through these wounds and often set up infection in the limb or spinal joints.

By your own efforts you can do much to reduce the incidence of these infections by using clean methods at marking time. Don't mark your lambs in the sheep yards and don't use dirty instruments. The soil of sheep yards is always heavily contaminated with bacteria, so you would be wise to set up temporary yards for marking in a well grassed paddock.

If you use instruments and particularly a knife, make sure that you thoroughly clean and boil it before use; then during marking keep a tin of disinfectant beside you and wash the knife in it frequently. It wouldn't be such a bad idea, you know, if you were to have two knives and change them after about every tenth lamb, keeping the spare one in disinfectant.

If you are unlucky enough to strike an outbreak of joint infection (arthritis) after docking, you must get in quickly with penicillin if you want to save the lambs. If the infection localises in the spinal joints, you won't notice anything wrong with a lamb until it becomes paralysed, by which time it is too late to save it.

Enterotoxaemia or Pulpy Kidney

An infection which enters through the mouth and the only one which we will discuss is enterotoxaemia or pulpy kidney, an important, if not the most important, cause of death in lambs. Some understanding of how this disease develops will help you to appreciate the methods of prevention and control.

Basically pulpy kidney is the result of the rapid multiplication in the small intestine of an organism which is normally present after being picked up by the lamb from the pasture. This organism produces a powerful toxin or poison which is absorbed from the lower part of the small intestine. If this is so, you will ask then why all lambs don't get pulpy kidney.

The reason is that normally there are insufficient organisms present to produce enough toxin to do any damage, but if for some reason the passage of the contents through the intestine is slowed down, the organisms multiply rapidly and produce sufficient toxin to set up the disease. Unfortunately for the fat lamb producer this set of circumstances occurs more often in the best lambs than in the tail of a mob. The disease is usually more prevalent on the best pastures and can occur at any age from birth onward, though in our experience in the Auckland Province it is most common these days at 10 to 15 weeks.

In the most common form of the disease death occurs in a matter of hours after the onset of symptoms, so that rarely do you ever see an affected lamb alive; most are found dead. If you do find an affected lamb before death, it is obviously in pain, may be scouring a little, and finally goes into a convulsion with head thrown back, frothing at the mouth, and paddling of the legs.

When you open a lamb which has died from pulpy kidney there are fairly characteristic changes to be seen, but only if it has been dead for a few hours; if it has just died or been killed in the final stages, very few changes are present and a diagnosis is difficult, but if it has been dead for a few hours quite characteristic changes are usually present.

The sac around the heart is filled with a clear, slightly yellowish fluid which often has changed to a thick jelly-like clot; the kidneys are soft and mushy, hence the name pulpy kidney, and have obviously degenerated much more than the other organs, which are still firm. The intestines are very fragile and cannot be run out, as they break with the slightest pull; they are also much thicker than normal and the chain of associated lymph nodes is swollen and juicy and up to about four times normal size. Remember that these changes and particularly the pulpy state of the kidneys are not present until a few hours after death.

Prevention and Control

The methods of prevention and control of this disease are from your point of view the most important aspect. It is not my intention to go into careful detail, but to give you the general principles of prevention and control. Likewise it is not my intention to say that you must use this or that method. I believe that the disease must be considered finally as it applies to each farm and that can only be done by you in discussion with your veterinary adviser. Now the prevention of pulpy kidney is by vaccination either of the ewes or the lambs; but which you vaccinate depends on the age at which the lambs are affected.

If from previous experience it is known that you can expect most of your losses in lambs up to about 6 weeks old, you must vaccinate the ewes, but if most losses are after this age, you must vaccinate the lambs at marking time.

If losses occur both before and after 6 weeks, you must vaccinate both the ewes and the lambs.

Vaccination of the ewes transfers protection to the lambs by means of antibodies in the first milk or colostrum; this type of immunity lasts for only a few weeks and, of course, if for any reason a lamb does not get colostrum, it is not protected. If the ewes have never been vaccinated before, even as lambs, they have to be injected with the vaccine twice; the first dose can be given at any convenient time providing it is given at least a month before the second; the second should then be given as near as possible to 2 weeks before lambing.

As lambing is spread over a few weeks, it is advisable to divide the ewes into an early and late lambing flock and treat them separately for the purpose of the second vaccination; this is done so that as many ewes as possible will get the second dose of vaccine about 2 weeks before lambing.

In subsequent years it is necessary to give the ewes only one injection of vaccine to boost the immunity just before lambing. One difficulty that you may strike is the unknown vaccination history of bought in ewes, so that you do not know whether they have been vaccinated once or twice or if ever.

As the immunity conferred by the milk of the vaccinated mother lasts for only a few weeks, vaccination of the lambs is necessary if most losses tend to be in lambs over 6 weeks. To give really good protection two injections should be given. It should be convenient to give the first injection at marking time at about 2 to 3 weeks and the second can be given 3 to 4 weeks later. The first dose of vaccine does confer some immunity, but it often is insufficient if a bad outbreak occurs later. What the first dose really does is sensitise the body to a second injection later and when this second dose is given the body responds more quickly and gives a stronger and longer lasting immunity.

If you wish, you can, having given the first injection, delay the second until an outbreak of pulpy kidney is threatened. Now don't take me up wrongly over this.

I don't mean that you go out one morning to have a look at your flock and say "Ah yes, I think we're going to have an outbreak of pulpy kidney, I'd better vaccinate the lambs again," just as you'd look at the sky and say "Mm, I think it's going to rain." You don't know that an outbreak is threatened until you start to get losses. This method is obviously a bit risky, for there is a delay of a few days before the second injection takes effect.

Now if you haven't vaccinated the ewes or the lambs and you have an outbreak of pulpy kidney, all is not lost, for you still have pulpy kidney antiserum to fall back on. This is more expensive than vaccination, but has the advantage that it gives immediate though only a short protection. A few years ago the antiserum was used very little, but during the past 2 years there has been an unprecedented increase in the amount of antiserum used. Reports from veterinary surgeons who have used antiserum in serious outbreaks show that the antiserum can be of very great value and in many cases losses ceased immediately.

Apart from these methods of prevention and control certain other recommendations are usually made. Anyone who has had experience of this disease in his lambs knows that the most serious losses usually occur in the best and fastest growing lambs on very good pastures. Because of this we advise farmers to give the flock a check by moving it to a poorer pasture, if one is available. This will often cut losses considerably, but has obvious disadvantages, for it is well known that young growing animals take a long time to pick up again after a check like this. Vaccination alone sometimes causes sufficient check to growth to hold an outbreak until immunity develops. Whereas the disease is most common in the most forward lambs, it is by no means unknown in flocks that are not doing well, so it would not be wise to check them any more by cutting down the food intake. Over-eating of lush pasture is not, then, the only factor predisposing lambs to pulpy kidney.

This now brings me to the relationship between tapeworm infestation and pulpy kidney. There does seem to have been an increase in some areas in both these conditions in lambs and because both occur at the same time we have heard it said that tapeworms cause pulpy kidney. I will agree that this could look like cause and effect, but just because two things happen at the same time it does not follow that one caused the other.

There is no doubt as to the true cause of pulpy kidney and that is the production of a toxin by a specific organism in the intestine. Tapeworms by interfering with the passage of the contents of the intestine either through their bulk or perhaps by irritation to the intestine may well predispose a lamb to pulpy kidney, but they **do not** cause it.

I have seen many lambs that died of pulpy kidney both with and without tapeworms and I have seen many that had a heavy tapeworm infestation and were sold as first-class fat lambs.

My advice to you would be this: if you feel you must do something about the tapeworms, dose the lambs with nicotine-copper sulphate drench, but if pulpy kidney is also occurring, don't neglect to do something about it too

The subject of pulpy kidney is very complex. For this reason it is impossible and would indeed be foolish of me to say that you must do this, that, or the other to prevent or control pulpy kidney on your farm. Each case must be considered on its merits and advice given accordingly; if you are worried by this problem, have a talk with your veterinary surgeon or Livestock Instructor and get the advice to suit your farm.

Other Causes of Lamb Losses

Most other causes of lamb losses tend to be sporadic and as an overall percentage they are very low, but on individual farms they can be quite serious. Some of the more important of these are copper and cobalt deficiency, white muscle disease, leptospirosis, and stomach worm infestation. White muscle disease occurs in the South Island only and occurs mainly on legume-dominant pastures and is somehow tied up with a deficiency of vitamin E.

The other four conditions can either be prevented or controlled and I intend to make only a few comments on each.

Copper deficiency is usually seen in lambs under 4 months and is shown by either a staggering gait or very fragile bones which fracture easily. It does not cause unthriftiness. An affected lamb cannot be saved by dosing with copper, but a soil deficiency can easily be overcome by top-dressing.

Cobalt deficiency rarely occurs until after weaning and causes unthriftiness and marked loss of weight if the deficiency is severe. Dosing with cobalt gives a rapid response.

Leptospirosis has been seen in a number of flocks from different districts in lambs about 3 to 6 weeks old. The main features are jaundice and redwater. This disease is transmissible to man and causes a very serious illness, so if you find any lambs which die and have a distinctly yellow skin leave them alone. Call in your veterinary surgeon at once and get advice on how to treat any sick lambs and prevent it in the remainder.

Stomach worm infestation, or haemonchosis, is not in our experience a serious cause of losses in lambs up to 6 months, but may occasionally cause trouble. Lambs should not have to run the risk of heavy worm infestation if the ewes are kept relatively free from worms. If heavy infestation does happen, remember that these worms are blood suckers and can be killers and that lambs in prime condition can and do die from stomach worms alone. This is a fact which many sheep farmers are loathe to accept.

Immediate drenching with phenothiazine as soon as stomach worm infestation is diagnosed is imperative if the lambs are to be saved, but do not expect dramatic improvements in condition, for lambs which have become anaemic will pick up slowly. Put them on to your best pastures and give them every chance to get back into good condition.

This is by no means a complete list of the causes of lamb losses, but I have covered the important ones. I do not expect you to become your own veterinary surgeon and be able to diagnose all these diseases, but if you remember that you can keep navel infection and pulpy kidney under control and make an honest effort to do something about them, most of your worries about lamb losses in this age group will be over.

The Home Garden in October

By A. G. KENNELLY,

Horticultural Instructor, Department of Agriculture, Dunedin

THOUGH weather in October may at times be unsettled, the ground has warmed considerably since winter and given reasonably sunny days and good soil conditions all hardy plants will grow well. As the month progresses and danger of frost damage passes, first in the early and then in the later districts, half-hardy plants can be sown or planted.

SOW NOW

Beans (dwarf and climbing) Cucumbers Marrows Melons Pumpkins Sweet corn	When danger of frost is past or if protection can be provided
Lettuces Peas Radishes Turnips	Successional sowings
Cabbages Cauliflowers or broccoli	For harvesting in autumn and winter
Kale Beetroot Brussels sprouts Carrots Spinach or spinach beet	If not sown last month

PLANT OUT

Lettuces
Onions (southern districts)
Potatoes (main crop)
Tomatoes (late in month in most districts)

Silver beet Cabbages (summer) Cauliflowers	If not planted last month

IN most districts October is the preferred month for main-crop sowings of hardy vegetables. Early sown crops should be well established and should be kept weed free. Some early crops may need thinning and where this is necessary, it is best done before the seedlings become crowded.

Where frost danger is past, or can be guarded against, frost-tender plants such as dwarf and runner beans, cucumbers, marrows, squash, pumpkins, and sweet corn can be sown and tomatoes set out. Young seedlings raised under glass can be hardened off gradually (where conditions are still too severe to permit them to be established in the open) by progressively increased exposure to outside conditions. Land to receive them can be prepared by cultivation, manuring, and the erection of shelter, stakes, or supporting wires. But in most districts sowing and planting of frost-tender vegetables are best deferred until toward the end of the month. Where killing frosts are still likely, as in most of the plains areas of Canterbury, it is advisable to delay until the first or second week in November.

Home gardeners who raise their own autumn and winter cabbages and cauliflowers or broccoli should sow during the month or in most districts not later than early November to have sturdy, well-grown plants for setting out in December or January.

Asparagus

In most districts asparagus shoots appear above the ground a little after the time of the last killing frost, though occasionally a severe late frost will damage the early shoots. On newly established beds—in their third year from the time of sowing the seed (the second year after planting out)—the period of cutting should not be more than about 2 weeks. In the fourth year the cutting period should not exceed about half the season or about 4 weeks. Thereafter cutting can continue each year for from about 6 to 10 weeks according to seasonal growth and vigour of the bed.

Dwarf and Runner Beans

In North Island and South Island districts not subject to late frosts an early sowing of either dwarf or climbing beans can be made from about mid-October. Whether runner, climbing (pole), or dwarf beans are grown usually depends on the space available.

Climbing beans, if well grown, yield more heavily than dwarf, and the stringless climbing varieties are not inferior in flavour and quality to the best dwarf varieties. Runner beans of the Scarlet Runner type are perennials and do not need to be resown every year. Climbing (pole) beans and dwarf beans are annuals.

Soil Preparation

The soil should be well drained and cultivated before sowing, and though it need not be more than moderately rich in organic material and nitrogen and potash, the addition of phosphates or complete fertilisers rich in phosphates has been found beneficial on many soils where trials have been carried out. Beans are tolerant of moderately acid conditions, but lime

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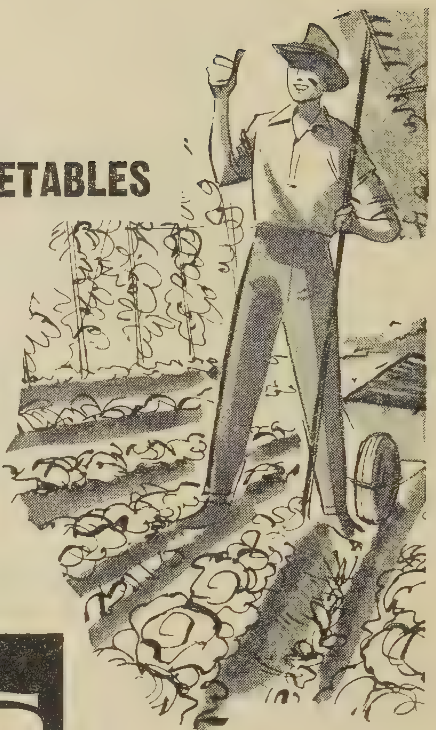

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should be applied at 2 to 3 oz. a square yard some time before sowing if the land has not been dressed with lime recently.

Climbing beans can be grown in rows without staking by slashing or pinching back excessively long growth, but where growing conditions are favourable best results are obtained if vines are staked or allowed to climb a support. With dwarf and climbing beans more than one sowing will be needed to ensure continuity of supply. Runner beans crop over a longer period than climbing or dwarf types.

Dwarf beans have the advantage of developing pods earlier, taking about 7 to 9 weeks, compared with about 9 to 10 weeks for most climbing varieties.

Sowing

Bean seed should be sown 1 to 2in. deep, but in exposed positions or on soils that tend to dry out a drill 2 to 3 in. deep should first be drawn out and the seed pressed 1 to 2in. deep (according to whether the soil is heavy or light) in the bottom of it. Dwarf beans can be sown in single rows or double rows 6 in. apart with 2 ft. between the rows. Seed should be sown or seedlings thinned to 2 to 4 in. apart; the richer the soil is the greater the distance between plants should be.

Runner or climbing beans are usually sown or thinned to 6 to 8 in. apart in double rows about 9 in. apart and 3 to 4 ft. from other vegetables.

Butter or waxpod beans are stringless varieties of french beans with pale or golden pods. There are tall and dwarf varieties. Butter beans should be planted a little later than ordinary french beans. Good varieties include Pencil Podded Wax and Round Pod Kidney Wax (round-podded varieties) and Woods Centenary (butter) and Sure-crop Black Wax (flat podded).

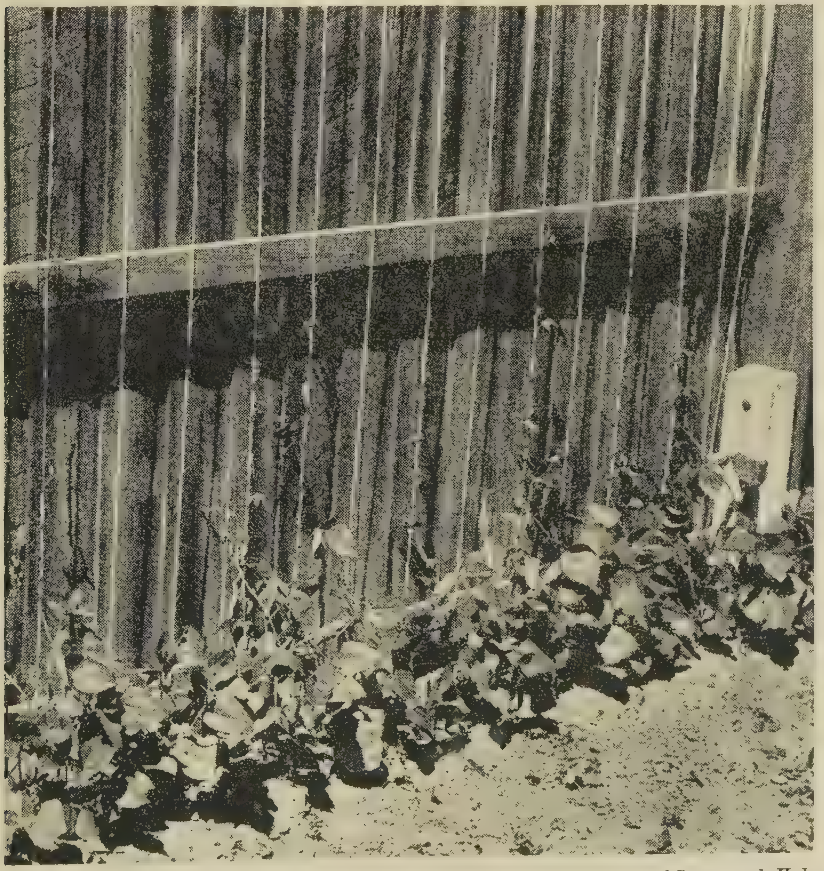
Varieties

Good varieties of dwarf beans include the following:

Black Valentine: Heavy bearing with dark green, stringless pods about 7 in. long. Often used for a second early or main crop.

Masterpiece: Crops well with straight, stringless pods; for early main crop or a late sowing.

Tendergreen: Crops well and has tender, dark green, straight, fleshy, round pods 6 in. long.



[Green and Hahn

Runner and dwarf beans need warm, frost-free conditions. They can be sown this month where danger of frost is past or if provision can be made for protecting them.

[Green and Hahn

Asparagus shoots are tender and tasty and the plant could be more widely grown to provide a vegetable at a time when in many gardens very little is available.

Good climbing varieties of beans include:

Fardenlosa (Market Wonder): Widely grown commercially because it crops heavily with straight, tender, fleshy, stringless beans up to about 10 in. long. A strain of Fardenlosa "Fardenlosa Shiny Pod" is now widely grown. It is listed under several names and has an attractive shiny green pod and is reputed to retain its crispness longer after harvesting than the ordinary strain of Fardenlosa.

Westralia: A useful variety somewhat similar to Fardenlosa in cropping. As it appears to be highly resistant to bean rust, it should be specially valuable in districts, particularly in autumn, where that disease is troublesome.

Other useful varieties of dwarf and climbing beans are listed in most seedsmen's catalogues.

Cabbages and Cauliflowers

An October sowing of quick-maturing cabbages or cauliflowers should produce heads for cutting within

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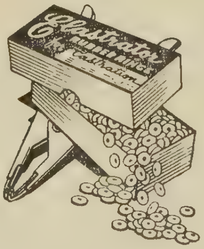

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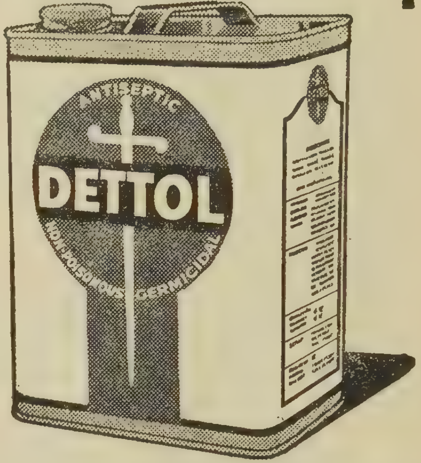

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[*Green and Hahn*

Main-crop potatoes are planted in most districts in October, though where late frosts are to be expected planting is best deferred until late in the month unless the emerging shoots are to be given protection.

about 4 months. Where temperature, moisture, drainage, and plant foods are suitable, quick maturing varieties of cabbage should reach usable size in less than 3 months. Quick-maturing varieties of cauliflower usually require a little longer, even in favourable conditions, but both vegetables respond to rich soils, ample moisture with good drainage, and moderate to fairly high temperatures.

Continuity of supply can be assured in most gardens by regular successional sowing of varieties having similar maturity periods or with cauliflowers by sowing different varieties which have maturity periods varying from about 3½ to about 7 months.

Popular varieties of cabbages include Golden Acre (early), Copenhagen Market Slowbolt (slightly later), and Green Acre.

Varieties of cauliflower include Walcheren, All Seasons (All The Year Round), Early London, Phenomenal 4 months, Phenomenal 5 months, and Phenomenal 6 months.

Potatoes

Because they are a staple article of diet, potatoes are the most generally planted of vegetable crops in New Zealand. They are grown in practically every home garden; even where space is at a premium it is usually profitable to grow at least one row of early potatoes.

Many home gardeners who have the space have tried growing a considerable area and have been discouraged by their comparative lack of success and as a result now plant potatoes in a perfunctory way. The potato crop is, however, so important that the selection of varieties and planting and cultivation deserve a good deal of attention.

One of the most important points in growing potatoes is the use of Government-certified seed. Few vegetables are subject to as many diseases as the potato and many of the diseases do not show in the tubers. Tubers infected with virus diseases such as leaf roll, mosaic, and crinkle may appear healthy and of a desirable type, yet if it were not for the seed certification scheme, these diseases would reduce the total yield of potatoes in New Zealand by half or perhaps two-thirds. Virus diseases are transmitted mainly by aphids (greenfly), the lower incidence of which in the South Island is the main reason for the growing of most of the certified seed there.

Apart from the purchase of certified seed the important points in potato growing are choice of variety, soil condition, and cultivation. Though the home gardener can usually make his soil more fertile by such means as drainage, rotation of crops, the addition of humus or humus-forming materials, and the judicious application of fertilisers, he cannot change his soil type, and though he may be able to provide shelter, he cannot change the aspect of his garden. Thus, if his garden soil is a heavy clay loam and has a southerly aspect, he may be able to mitigate its worst features, but can rarely do more.

He should therefore select varieties most suited to his conditions. If he has space, he should try several of the most suitable varieties for 2 or 3 years; a 1-year trial is rarely of much value, as conditions may be exceptional.

Soil and Lime

The soil for potatoes should preferably be deeply and thoroughly cultivated, as thorough preparation of the soil not only ensures a perfect seedbed, but helps to maintain it in a satisfactory state of moisture, aeration, and temperature. Soils that have been trenched should, however, be given time to settle before planting begins.

Because they may induce a condition which favours scab, heavy dressings of organic manure are not advisable just before planting. A heavy dressing applied the previous year so that it is thoroughly decomposed or a green crop dug in some time before planting will, however, usually give satisfactory results, as also will the addition of such material as grass clippings.

Soils which have recently been heavily limed should not be used. The potato is tolerant of acid conditions, and in soils infected with potato scab the growth of the organism will be suppressed if the soil is medium to strongly acid. Apart from soil acidity the development of potato scab is influenced by both soil temperature and moisture. Its development is usually favoured by soil slightly drier than desirable.

Fertiliser

The fertiliser required for potatoes depends largely on the amount of organic material previously incorporated in the soil, but in general it has been found in Department of Agriculture trials that on the lighter and medium soils that are in fairly good condition a mixture of 3 parts of superphosphate and 1 of sulphate of ammonia applied at about 1½ oz. a yard of row is satisfactory. On rich alluvial soils the dressing should be 5 parts of superphosphate to 1 part of sulphate of ammonia applied at about 1½ to 2 oz. a yard of row.

On many home garden soils sulphate of potash will give improved results if added in the proportion of 1 part to either of the mixtures given. As an alternative to superphosphate and sulphate of ammonia equal parts of superphosphate and blood and bone can be used.

Planting

The simplest way to plant is usually to open trenches about 4 in. deep and 2 ft. apart and to dust the fertiliser along them. Tubers can be set 10 to 16 in. apart in these rows. Early crops which are to be lifted as new potatoes can usually be planted closer.

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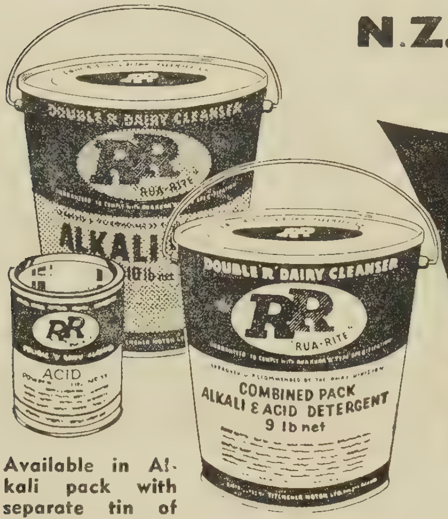
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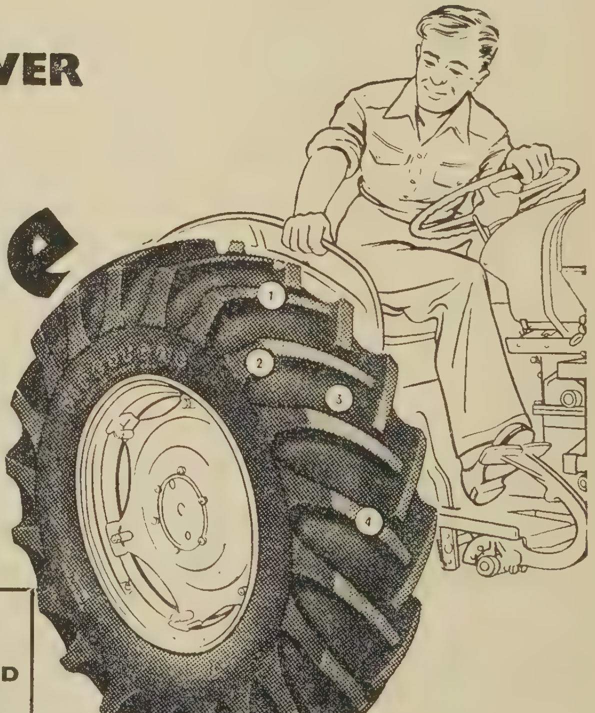

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[Sparrow

Side shoots should be removed while they are small from tall tomatoes. They are best held so that the fingers do not touch the remainder of the plant, because virus disease can be transmitted by the fingers.

If the seed tubers are large (4 oz. or more), they can be cut into two or more sets. Each should have at least two eyes and a minimum of cut surface.

Cut tubers should be planted immediately. The soil should not be too wet or too dry. If the cut surface is permitted to dry out before the protective skin is formed, the plants are likely to be poor. Dusting the cut surface with ashes, sulphur, or lime to dry it is not necessary, though sulphur may have some value because of its fungicidal action.

Potato tubers do not need to be sprouted, but sprouting is of value, as it gives earlier growth and with early varieties, earlier lifting. With main-crop varieties, too, the crop gets a better start and in most seasons matures earlier. Short, sturdy shoots should be aimed at, as long, weak shoots are easily knocked off or damaged in planting.

Varieties

The Department of Agriculture carried out about 150 observational trials in the principal potato-growing districts with some of the most widely grown varieties of potatoes over 10 years before 1957. From these trials yield figures have been obtained, many of which differ widely from popularly held views of home gardeners and others on the productiveness, and therefore, very largely, the value of certain varieties.

Data obtained were principally on yields of table and seed potatoes according to soil, variety, and specific localities.

Eighteen varieties were grown, though the same number of trials was not carried out in all districts. Some of the varieties were not included in trials in some districts, but the results are interesting. They should lead to reassessment of some varieties by many home gardeners, even though final judgment of a variety should rest on its yield when compared accurately with others under the gardener's specific conditions. However, texture and flavour may also have to be balanced against yield.

Glen Ilam was outstanding in most districts. **Ilam Hardy** was average in Southland, and outstanding in West Coast, North Island (W.C.N.I.) and South Canterbury, and well above average in other districts.

Dakota was only average in W.C.N.I., but was above average elsewhere and outstanding in Rangiora-Ashburton (Rangiora to Ashburton), South Canterbury, and Otago. **Arran Banner** was above average in all districts, particularly in Blenheim-Nelson and Rangiora-Ashburton.

Inverness Favourite was average in Auckland, well above average in Rangiora-Ashburton and Otago, and above average in other districts. **Iron Duke** was average in W.C.N.I., East Coast, North Island (E.C.N.I.), and Southland and elsewhere above average (though well above average in Auckland, Nelson-Blenheim, and Rangiora-Ashburton).

Arran Chief was average in Auckland and W.C.N.I., but above average in other districts, particularly South Canterbury. **Arran Consul** was well above average in Rangiora-Ashburton, above average in the North Island, and average in other districts. **Sebago** was average to above average except in Rangiora-Ashburton. **Arran Pilot** was average in most districts, but above average in Auckland and below average in W.C.N.I. and Nelson-Blenheim.

Dunbar Standard was average in the North Island, but above average in South Canterbury, Otago, and especially Southland. **Jersey Bennes** was well above average in Auckland and W.C.N.I., average in E.C.N.I., Rangiora-Ashburton, South Canterbury, and Southland and below average in Nelson-Blenheim and Otago.

Katahdin was poor in Auckland, Nelson-Blenheim, South Canterbury, Otago, and Southland and well below average in W.C.N.I. and Rangiora-Ashburton. It did best in E.C.N.I., but was still below average.

King Edward was poor in most North Island districts and Nelson-Blenheim, somewhat better in the South Island, but still below or well below average except in Southland, where it was average. **Chippewa** was average in E.C.N.I., but below average elsewhere and well below average in Rangiora-Ashburton and Otago and poor in Southland. **Cliff's Kidney** was below average in all districts and well below in W.C.N.I., Nelson-Blenheim, South Canterbury, Otago, and Southland.

Aucklander Short Top was generally below average, particularly in the South Island (poor in South Canterbury), but was average in Auckland, E.C.N.I., and Southland. **Aucklander Tall Top** was below average generally, except in E.C.N.I. and Southland, where it was average.

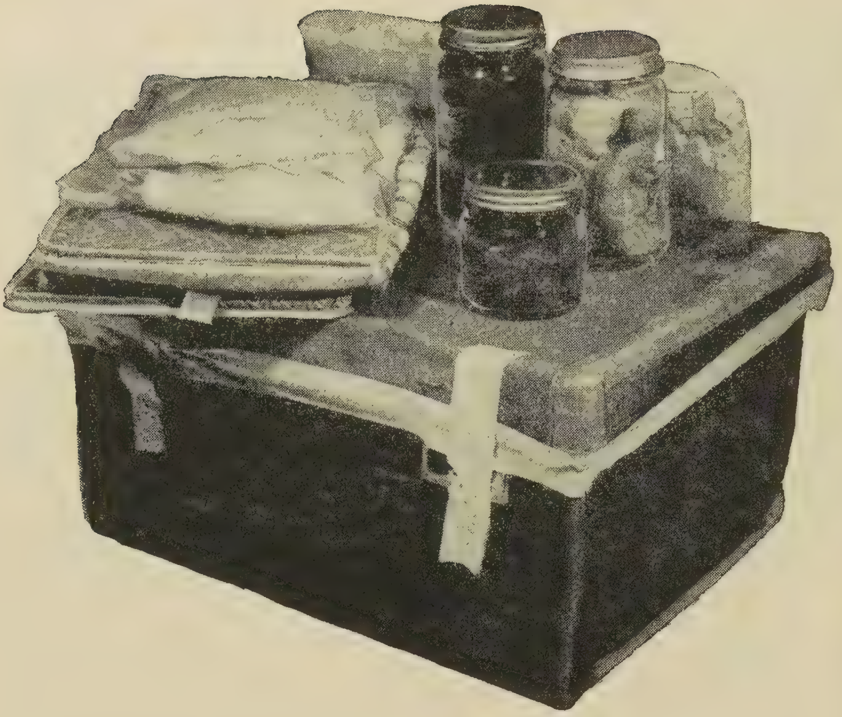
Tomatoes

In many districts tomato plants are set out in unheated houses in September. The young plants should be watered in moderation until they are well established and they should be watched for infestation with insect pests or infection with disease. Lindane spray will control aphids and DDT spray will control most active insects such as caterpillars.

Side shoots are best removed while they are small, but to reduce the likelihood of transmitting virus disease on the fingers side shoots should be grasped between the thumb and forefinger and bent so that they snap cleanly without leaving stubs in the joints of the leaf branches. Fingers should not touch any other part of the plant except side shoots before their removal.

Other Vegetables

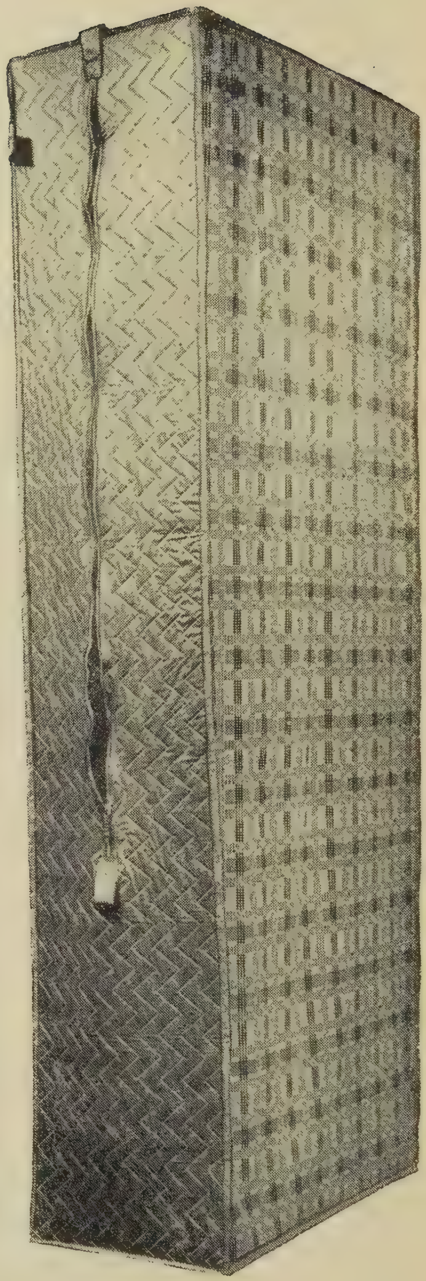
The culture of root crops such as beetroot, carrots, and celeriac and of lettuce, peas, onions, and chinese cabbage, which can be sown or set out during October, was discussed in last month's "Journal".



Storing Winter Woollens

By MAUD B. STRAIN,
Home Science Instructor, Department of Agriculture, Dunedin

OFTEN a storage cupboard, a dark, warm, unfrequented place, is a happy hunting ground for moths, giving them easy access to unlimited food. If these creatures are not to have rights to undisturbed eating, something must be done to make the cupboard repellent to them and the food supply inaccessible to any that are taken in inadvertently. The time is coming when all woollens will be proofed during manufacture against moths and carpet beetles, but until then every effort should be made to make conditions so unattractive to these pests that they will die of starvation rather than attack stored woollens.



Upper left—Some of the methods of protecting stored woollen materials from moths and carpet beetles by preventing the pests gaining access to them. Above—A plastic wardrobe fitted with a slide fastener and hanging from a hook provides satisfactory storage for frocks and suits if they have been cleaned and decontaminated before being placed inside. The small holes at the top and bottom of the slide fastener should be covered with sticky paper or adhesive tape.

MOTHS usually enter a house by being brought in as eggs or larvae on materials after being picked up on contact with woollens, upholstered furniture, or the fur or hair of domestic pets. Carpet beetles fly readily and in late spring may be seen on window ledges and on flowers in the garden, where one of their chief preferences is the white hydrangea.

The moth or beetle lays the eggs, which hatch out in a few days into larvae (caterpillars or grubs), which do the damage. They are voracious eaters and feed on wool, hair, and fur and fabrics made from any of these; carpet beetle grubs will attack leather.

If articles are in regular use and being worn and washed repeatedly, the danger of damage from these pests is negligible. It is when garments are left hanging in dark cupboards or stowed away in drawers for long periods without attention that trouble starts, as such conditions give moths a chance to lay eggs and allow the eggs to develop into caterpillars and the caterpillars to feed on the woollens.

Moth-proofed Materials

The best insurance against pests is to buy goods made from materials that have been permanently proofed during manufacture. Various moth-proofing compounds have been available to manufacturers for many years, but their use has been restricted for various reasons. The earlier ones had undesirable side effects, and as the process was expensive, this added to the cost of the fabric.

One compound, "Mitin", has been used for a number of years for proofing some knitting wools and some fabrics. It is applied as a colourless dye and combines with the wool molecule and is therefore permanent during the life of the wool, but it does not alter the feel, appearance, or characteristics in any way and is unaffected by washing or dry cleaning.

Recently a substance, dieldrin, has been introduced which is potent at very low concentration and is correspondingly inexpensive. This gives permanent protection and is used particularly with heavier materials not subject to frequent washing, such as carpets, felt floor coverings, and furnishing materials.

Temporary protection is available with dry cleaning. Many commercial dry cleaners moth-proof woollen goods during the cleaning process. This is not permanent and must be renewed from time to time.

Preliminary Sterilisation

As moths and carpet beetles more readily attack soiled and dusty fabrics, the first essential is to keep woollens clean, remove spots as they appear, and make sure that any goods to be stored are free of dust and grease and other spots and not contaminated with any form of moth or beetle life. This can be ensured by:

Washing: The normal process of washing, drying, and ironing will kill off all stages of moths or beetles.

Dry cleaning, in addition to cleaning the article, will kill any stage of moth or beetle life.

Brushing, beating, vacuum cleaning, and hanging in the sun: Brushing, beating, and vacuum cleaning dislodge eggs and grubs. Direct sunlight at 70 degrees F. will kill moth eggs in 1½ hours and the moths themselves in a few minutes, though a little longer is required to kill caterpillars.

Steam pressing will kill all stages. A temperature of 140 degrees F. is fatal. Pockets should be turned out and all seams and folds investigated for eggs and caterpillars.

One or other of these processes is applicable to all woollens.

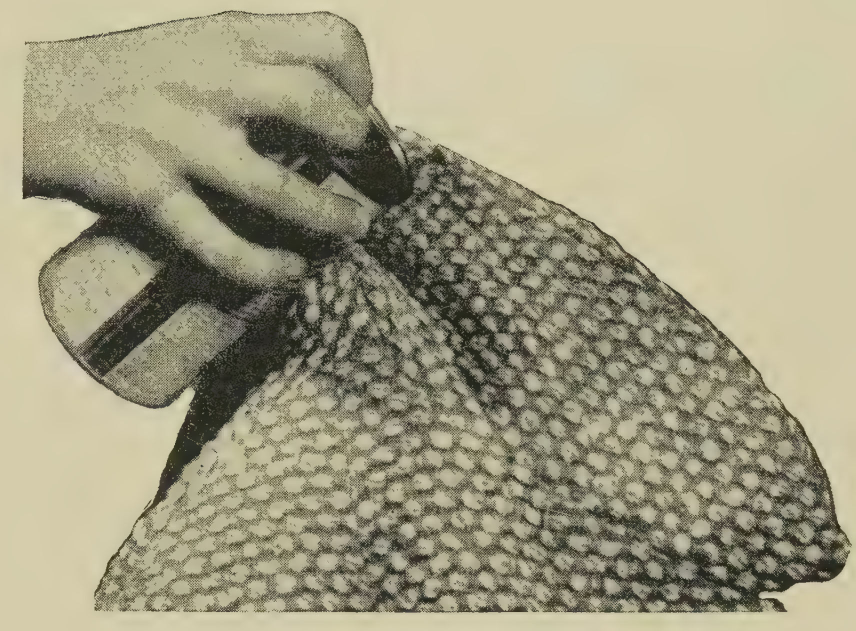
Storage Methods

Clean woollens may be protected during storage by any of the following methods:

Making Access Impossible

The goods can be folded and wrapped in several layers of paper and all the edges of paper in the parcel should be covered with gummed paper or adhesive tape so that the contents are completely sealed.

A plastic or fabric wardrobe with a well fitting slide fastener is good for frocks, suits, and fur coats. The two ends of the fastener should be sealed with adhesive tape.

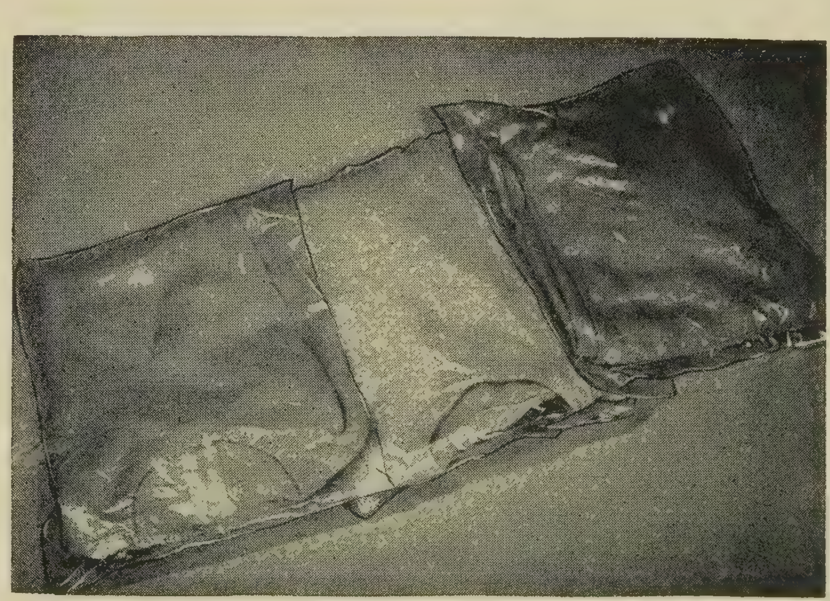


Temporary protection can be gained by spraying woollens with benzene hexachloride, DDT, dieldrin, or similar compounds. Special attention should be paid to hidden places such as under collars and seams of garments.

Large plastic bags are good for blankets, and others of varying sizes are excellent for storing small articles. The bags must always be tightly sealed. Small articles such as babies' bootees, gloves, and scarves can be stored in glass, screw-top jars. One advantage of this method of storing is that because the plastic or glass is transparent, the contents of the bag or jar can be easily seen when any particular article is required.

Cold Storage

Low temperatures make grubs dormant and kill moths and beetles. They prevent the growth of larvae and consequent damage to any goods



Jumpers and cardigans stored in a plastic bag which has been sealed with adhesive tape.

in storage, but they do not necessarily kill all forms of moth life, and when articles are taken from storage they are again vulnerable.

The home deep freezer with its near-zero temperatures will in time destroy all stages of clothes moth or carpet beetle. If sealed packages are left in the freezer at —15 degrees C. (5 degrees F.) for 48 hours before storage, they are safe for as long as the seal is unbroken.

Use of Fumigants

Woollens stored unwrapped in chests or trunks should be protected with a solid fumigant. The most usual ones for home use are paradichlorobenzene and naphthalene. To be effective these must be used in high concentrations, 1lb. of fumigant to 8 cub. ft. of space, that is, 1lb. of fumigant to an average storage chest.

The action depends on the fumes given off during slow evaporation, and therefore storage containers must be carefully sealed. Gummed paper placed over places where the lid joins the container, including the hinges and the lock, will keep the container airtight. Once the seal has been broken and the container opened the concentration of the fumigant will be diluted and its moth-destroying potentialities lost.

A garment bag would require 1 oz. of fumigant and must be sealed.

It should be noted that a handful of moth flakes casually thrown into a trunk or chest will give nothing more than a false sense of security, and moth balls are useless except as missiles.

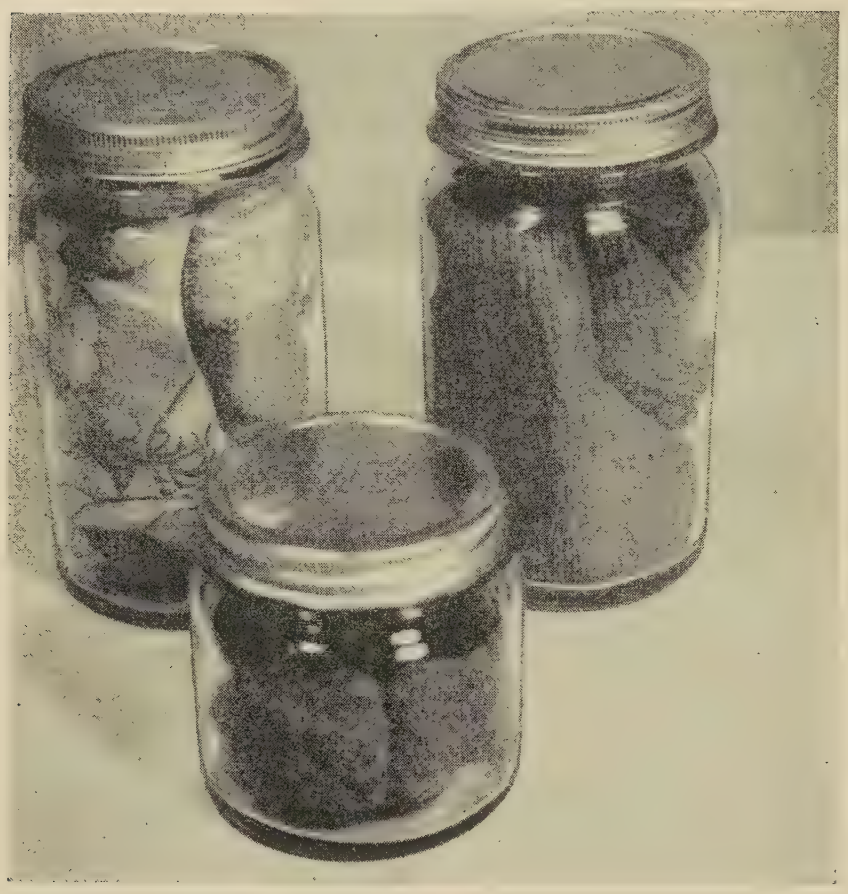
Storage Cupboards

Storage cupboards must be clean and free from dust and lint. Grubs can live on the lint that collects in the corners and crevices. Cupboards should be vacuum cleaned to remove loose lint and dust and then washed out with disinfectant. A 5 per cent lindane or DDT dust can be applied to shelves and cupboards to discourage moths and beetles from laying their eggs.

Routine use of a residual insecticide such as dieldrin, lindane, or DDT in spraying screens and around doors and windows will do much to prevent infestation by household pests.

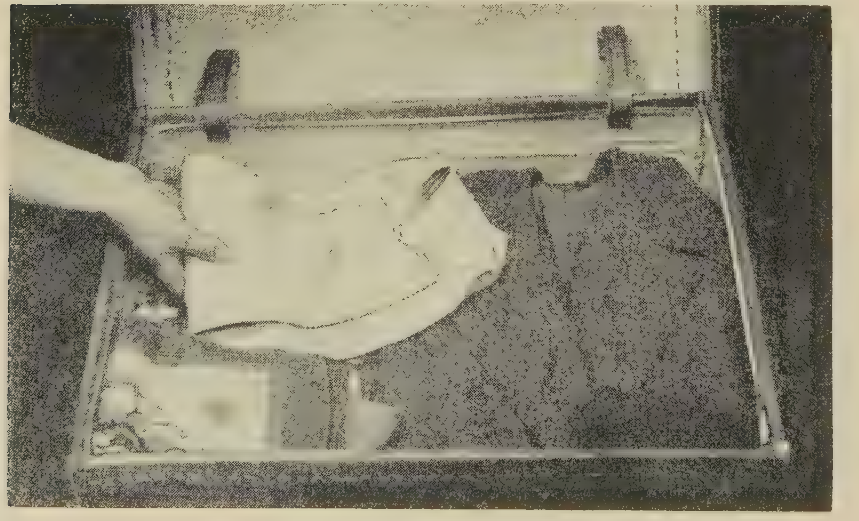
Good housekeeping, including 6-monthly inspection of all stored goods, and thorough sanitation are most important.

Occasionally a solitary grub is found in a drawer or similar place. How this comes about is not clear, because after a beetle lays its eggs several grubs would be expected. It is thought possible that several grubs have hatched out, but in the struggle for existence only the strongest has survived.



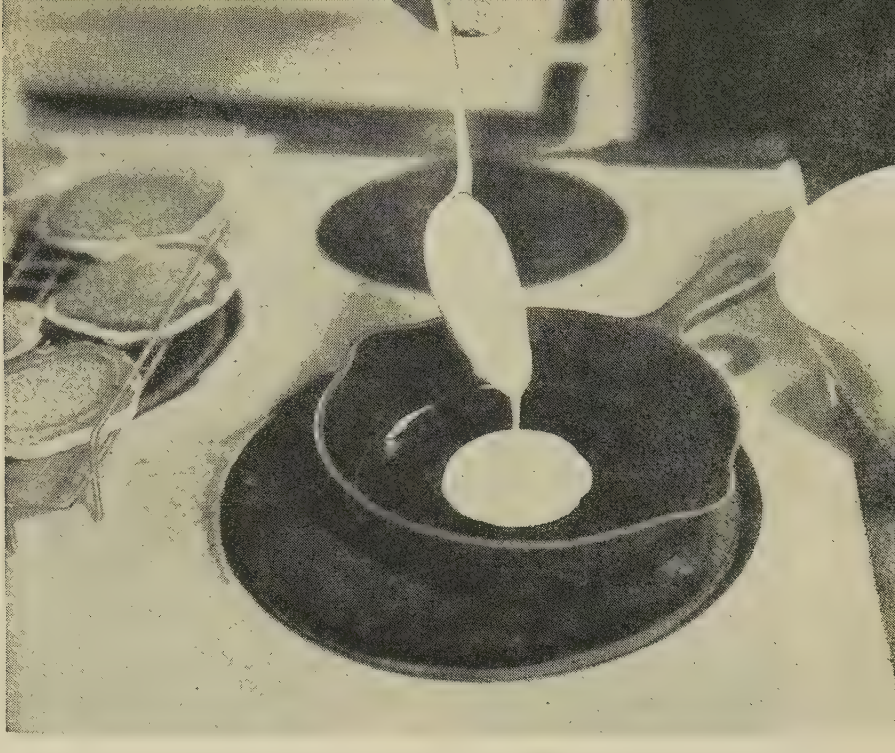
Small articles like gloves, socks, and scarves can be safely stored in glass screw-top jars.

▼ Woollens, clean and uncontaminated with any form of moth or beetle life, can be stored in a large hat box or trunk if the edges of the lid and the locks, hinges, and key holes are sealed to prevent moths and carpet beetles from entering. Solid fumigants can be used as an extra safeguard.



Pouring Batters

By MAUD B. STRAIN,
Home Science Instructor,
Department of Agriculture,
Dunedin



Batter for girdle cakes should be thin enough to run from the spoon, but must be thick enough to maintain its shape.

A BATTER is "a flour mixture in which the proportion of liquid to flour is such that the mixture can be beaten with a spoon". Within the limits set by this definition there are variations from the very thin, pouring batter used for Yorkshire pudding to the thick mixture used for gems and muffins. This article is concerned with only one type of batters—those known technically as pouring batters.

THE main ingredients of batter are flour and liquid (including eggs); other ingredients such as sugar and flavourings are added to give diversity of texture and taste. Flour forms the framework of the product, but this framework may be greatly altered by other ingredients present.

The liquid used is generally either milk or water. Milk is usually preferred because of its greater food value and also because it gives a better flavour and helps with the browning of the product. The purpose of the liquid is to hydrate the flour, dissolve the sugar, salt, and protein, and release carbon dioxide from the baking powder.

Different proportions of flour to liquid give different products. Pancakes require a large amount of milk and relatively small amount of flour to make a thin batter that will spread quickly over the pan. Pikelets need a bigger proportion of flour to give a batter which will flatten when dropped from a spoon on to a heated girdle but which will not run.

If too much milk is added, the product is soft and flabby and does not rise; if there is too little milk, the mixture is difficult to shape and the product is dry and harsh in texture.

A small amount of fat, usually butter, though lard is also suitable, is included in some of the mixtures because it improves the flavour, texture, and keeping qualities of the product. If lard (unsalted) is used, a slight increase in the amount of salt will improve the flavour of the product.

Sometimes cream is used in place of milk. If the cream is thick and more than a negligible amount of it is being used, some adjustment may be needed in the quantities of milk and fat, because thick cream is, for baking purposes, regarded as two-fifths fat and three-fifths milk. Products made with cream are considered to have a better flavour and texture than those made with milk and fat.

Eggs add flavour and colour to flour mixtures, but more important with thin batters is their ability to give a "risen" product by providing the mixture with sufficient body to retain the steam or gas which makes the product rise.

Mixing

The amount of mixing desirable is influenced by the proportions of the main ingredients. With **medium thick** batters, as are needed for pikelets, the length of time of mixing is most important. A few seconds or a few strokes in mixing may make the difference between a good product and a poor one.

To reduce the amount of stirring necessary the dry ingredients and the liquid ingredients are mixed separately. The fat is melted and combined with the milk and beaten eggs. The liquids are then added all together to the dry ingredients and the mixture stirred only until it is dampened, and though it may not look smooth, best results are obtained if it is cooked at this stage. With **thin** batters as used for Yorkshire pudding the danger of overmixing does not arise.

Thin batter is used in Yorkshire pudding, popovers, pancakes, and timbale cases.

Medium thick batter is used for pikelets, girdle cakes, waffles, and fritter batter.

Fritter batter varies according to what it is being used for: **thin**, for covering pieces of food before frying in deep fat; **thicker**, for binding together small pieces of food, such as minced meat, finely chopped fish, or whitebait.

Batter Recipes

In the following recipes, where measurements by volume are given, the standard measuring cup (8 fl. oz.) and standard measuring spoons are used. All measurements are level.

Yorkshire Pudding

4 oz. of flour
½ pint of milk
2 eggs
¼ teaspoon of salt
1 to 2 oz. of dripping for cooking

Sift the flour and salt together into a mixing bowl. Make a "well" in the centre of the flour mixture. Beat the eggs and combine them with the milk. Stir sufficient of the liquid into the flour mixture to make a smooth

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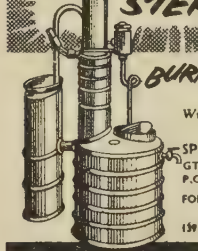

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10.8

Timbale cases being cooked in deep fat. On the trays are some cooked but unfilled. Those on the plate at lower right are filled with a savoury mixture.

medium thick paste. Add the rest of the liquid and stir until well blended. Pour into a hot roasting pan in which the dripping has been made very hot and bake in a hot oven (425 degrees F.) for 25 to 35 minutes. (3 to 4 servings.)

Popovers

4 oz. of sifted flour
¼ teaspoon of salt
½ pint of milk
1 tablespoon of melted butter
2 eggs, beaten

Put sifted flour and salt into a basin. Combine the eggs, milk, and butter and add gradually to the flour mixture to make a smooth batter. Fill oven-ware ramekins a third full and bake in a hot oven (450 degrees F.) for 20 minutes. Then reduce the heat to 350 degrees F. and continue baking 10 to 15 minutes or until the popovers are firm. The high starting temperature is necessary to release the steam which makes the popover rise. (8 popovers.)

Pancakes

8 oz. of flour
4 eggs
1 pint of milk
1 teaspoon of salt

Sift the dry ingredients into a bowl. Beat the eggs and combine them with half the milk. Make a well in the centre of the dry ingredients and stir the liquid in gradually to make a smooth paste. Add the other half of the milk. The batter should be the consistency of thick cream.

To cook the pancakes heat a dessert-spoon of lard in a frying pan until the lard just begins to smoke. Add ¼ cup of pancake batter, rolling and twisting the pan until the batter covers the bottom. When the pancake appears to be cooked through turn it with a spatula or by a quick toss of the pan (by a forward and backward thrust and pulling motion). Allow the pancake a few moments to cook on the under surface, then remove it to a paper dusted with castor sugar. Sprinkle with lemon juice and roll up. Serve hot. (About 15 pancakes.)

Pancakes (Alternative Recipe)

3 oz. of flour
3 eggs
½ pint of milk
½ teaspoon of salt

Sift the flour and salt into a bowl. Beat the eggs well. Add half the milk to the beaten eggs and stir this liquid gradually into the flour in the bowl to make a smooth paste. Add the remainder of the milk. Melt a dessert-spoon of butter or lard in a thick-based frying pan and heat it until the fat just starts to smoke. Pour in sufficient batter to cover thinly the bottom of the pan.

Allow the batter to set and then toss or turn the pancake over with a broad spatula and allow it to cook on the other side. Turn it on to a sugared paper and sprinkle it with sugar and lemon juice and roll it up. This makes a tender pancake. (About 5 light, rich pancakes.)

Timbale Cases

4 oz. of flour
¼ teaspoon of salt
1 egg
½ cup of milk
1 teaspoon of melted butter

Sift the dry ingredients together into a bowl. Beat the egg and combine it with the milk and melted butter. Stir the liquid into the dry ingredients gradually to make a smooth batter.

To cook the cases dip the waffle iron into the hot fat (375 degrees F.) for about 1 minute. Drain the fat from the iron and touch the bottom of the iron lightly against soft paper to absorb surplus fat. Then dip into the batter to within ½ in. of the top of the iron. (If it is lowered too far, the case will spread over the top when fried and be difficult to remove.) Lift out carefully, drain, and lower into the fat. Fry until crisp and brown. Lift iron from the fat, taking care that the case does not slip off. Turn upside down and drain on soft, crumpled paper. Serve filled with savoury mixture. (12 cases.)

Pikelets

4 oz. of flour
2 oz. of sugar
1 egg
¼ pint of milk
½ oz. of butter, melted
2 teaspoons of cream of tartar
1 teaspoon of baking soda
Or
3 teaspoons of baking powder

Sift the dry ingredients into a bowl. Beat the egg and add the melted butter and milk. Add the liquid to the dry ingredients and stir until the

In its home country Yorkshire pudding is served as a separate course before the meat and vegetables. In New Zealand it is traditionally served as an accompaniment to roast beef.

flour is dampened. Drop from a dessertspoon on to a hot, lightly greased girdle. Cook until bubbles appear on top and the under surface is golden brown. Turn and cook the other surface. (About 18 pikelets.)

Girdle Cakes

4 oz. of flour
½ teaspoon of salt
¼ pint of milk
1½ teaspoons of baking powder
1 egg, well beaten
1 oz. of butter, melted
1 oz. of sugar

Sift the dry ingredients together into a bowl. Combine the milk, egg, and melted butter and stir into the dry ingredients until the flour is dampened. Drop by spoonfuls on to a hot, lightly greased girdle. When risen, full of bubbles and cooked on the edges, turn and cook the other side. Serve hot with maple syrup. (12 girdle cakes.)

Waffles

8 oz. of flour
3 teaspoons of baking powder
2 oz. of butter, melted
3 eggs (yolks and whites beaten separately)
1¼ cups of milk
½ teaspoon of salt

Sift the dry ingredients into a bowl. Combine the egg yolks (well beaten) with the milk. Stir the liquid into the dry ingredients until the flour is dampened. Add the melted butter and fold in the stiffly beaten whites. Bake in a hot waffle iron. (8 waffles.)

Fritter Batter

1 cup of flour
3 teaspoons of baking powder
½ teaspoon of salt
½ cup of milk
1 tablespoon of melted butter
1 egg, slightly beaten

Sift dry ingredients into a bowl. Combine liquid ingredients and stir into dry ingredients until the flour is dampened. Use this batter for coating pieces of food and fry in fat at 375 degrees F.

This very thin Yorkshire pudding batter is poured into a hot roasting tin in which about 2 oz. of dripping has been melted and made hot.

Fruit Fritters

Add 1 oz. of sugar to the above recipe.

Banana: Cut bananas in half lengthwise and each half crosswise. Dip pieces in batter and fry.

Apple: Peel and core the apples and cut into rings ⅓ in. thick. Coat with batter.

Orange: Peel orange and remove pith. Separate into segments and remove seeds carefully. Dip segments in batter and fry.

Fish Fritters

Oyster: Beard oysters and remove bits of shell. Place on a cloth to dry off excess moisture. Dip in batter and fry.

Fish fillets: Wash fillets and dry on a cloth. Dip in batter and fry.

Whitebait Fritters

These require a slightly thicker batter than is used for coating food. Use a little less milk. Wash the whitebait (¼ lb.) carefully. Turn these on to a clean cloth, moving them along the cloth until they are free from water. (Water left on causes excessive spattering.) Fold the whitebait lightly into the batter. Fry in hot fat (375 degrees F.) until they are golden brown. Can be cooked in a deep frying pan. (12 to 15 fritters.)

Toheroa Fritters

6 toheroas
1 cup of flour
2 teaspoons of baking powder
1 teaspoon of salt
1 egg, well beaten
1½ cups of milk
1 tablespoon of melted butter

Sift the dry ingredients into a bowl. Combine the beaten egg, milk, and melted butter. Add the liquid to the dry ingredients, stirring only long enough to dampen the flour.

Wash the toheroas well, mince them, and add them to the batter mixture. Drop spoonfuls from a dessertspoon into shallow fat and cook them gently for 3 to 4 minutes on each side. Drain them on absorbent paper and serve with parsley and lemon juice. (4 to 6 servings.)

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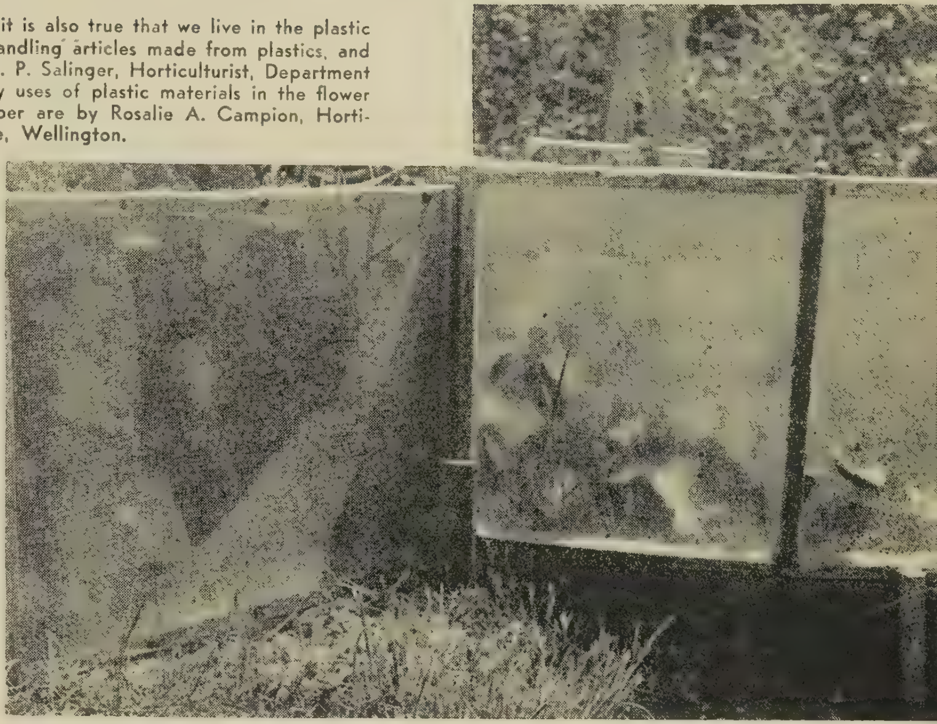
Plastics in the Flower Garden

IT is said that we live in the atomic age, but it is also true that we live in the plastic age. In almost every walk of life we are handling articles made from plastics, and the gardener is no exception. In this article J. P. Salinger, Horticulturist, Department of Agriculture, Wellington, describes the many uses of plastic materials in the flower garden. The notes on garden work for October are by Rosalie A. Campion, Horticultural Instructor, Department of Agriculture, Wellington.



Wooden frameworks stood upright to protect plants from the wind. The frame on the left is covered with wire embedded plastic and that on the right with polythene.

OVER the last few years plastic articles of one type or another have come into widespread use in the home; gradually plastic materials have made their way into the garden and certain types have proved of great value to the home gardener.

Types of Plastics

The description plastic applies to a range of chemicals manufactured from various raw materials. Each type has particular properties and it is important to choose the right type of plastic. Three types of plastic sheeting are of use in the garden, wire embedded in plastic, polyvinyl chloride (P.V.C.), and polythene (polyethylene).

The plastic with wire embedded in the material is sold in rolls; it is firm but flexible and is particularly useful as a substitute for glass. It will last for several years.

P.V.C. is a soft, very pliable material which stretches slightly; it is sold in rolls and has a limited use only, as it cannot be used in large pieces and soon disintegrates when exposed to the weather.

Polythene is sold in tubes or rolls or as bags and is the material extensively used for wrapping food; in heavier gauges it is used for water pipes and hoses, as it is very resistant to corrosion. The thinner gauges will normally last only two seasons in the open, but the material is cheap and easy to replace. Like P.V.C. it allows atmospheric gases to diffuse through it, while retaining moisture; the retention of moisture is both an advantage and a disadvantage, depending on the uses for which it is employed.

Plastic Materials for Glasshouses

Until the advent of plastics it had been necessary to use glass for greenhouses, frames, and cloches. Everyone realises that the chief disadvantage of glass is breakage, and where children play in the garden it is dangerous to use glass or the children need to be restricted in play. As most plastics do not break easily and are easy to cut and handle, they make an excellent alternative to glass for propagating structures and in addition they are a great deal lighter in weight, so they require less timber framework and yet still protect plants from the weather and transmit light.

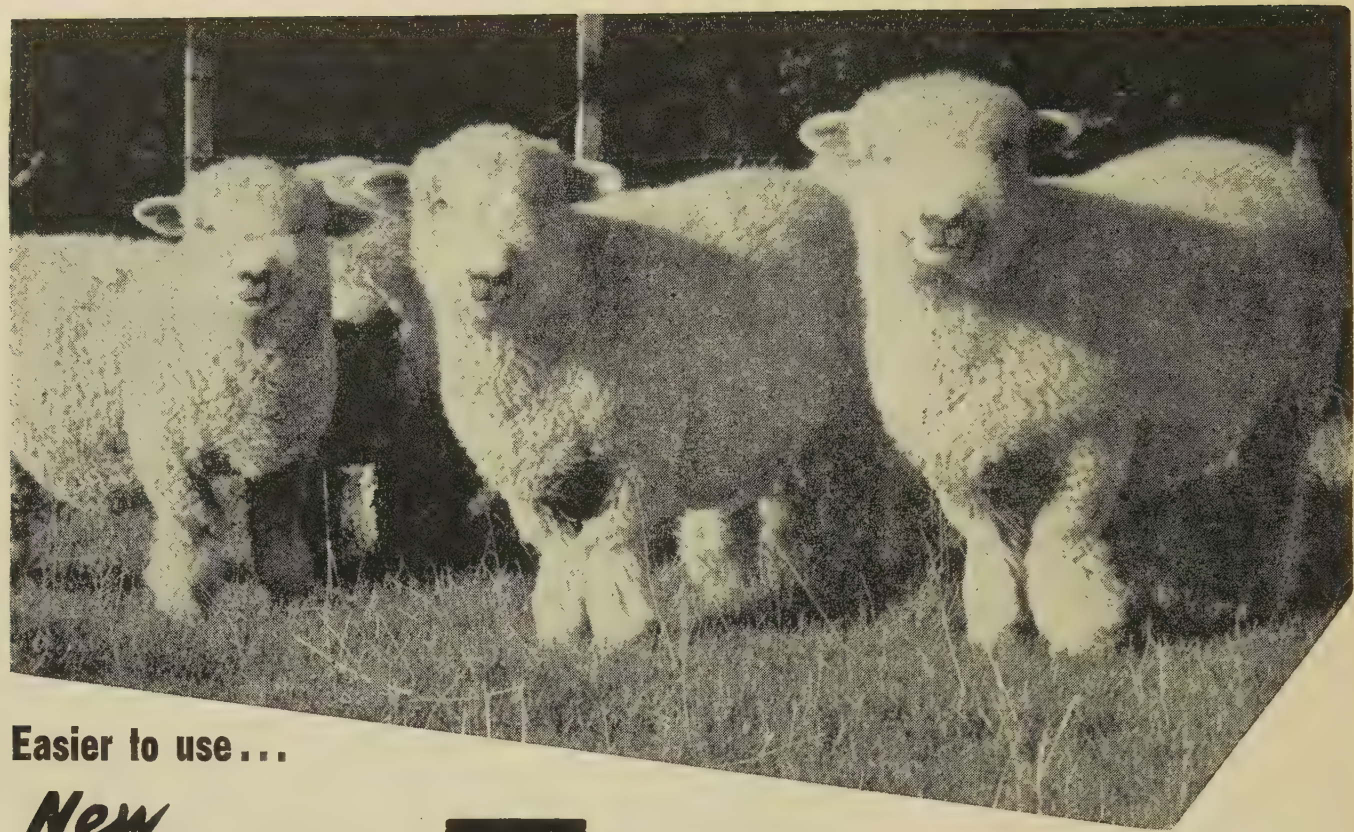
▼ Half-ripe cuttings inserted in a pot of sand and completely enclosed in a polythene bag. By the reduction of transpiration in this manner the cuttings root more readily.

The most permanent material is the wire embedded plastic which can be cut with strong scissors and nailed to a timber framework. When a glasshouse is being built of this material, as in the illustration on page 285, it is necessary to nail the plastic to the timber framework, preferably with galvanised nails. It is also important to provide sufficient ventilation, as in these structures temperatures can rise even higher than in a greenhouse built of glass.

Care should be taken that the ventilators are not too large; otherwise the wind will cause the material to flap. Preferably small ventilators should be placed just above ground level and at the ridge; if necessary a small ventilator can also be fitted at either end about 2 ft. below the ridgeboard.

Polythene Greenhouses

Since polythene sheeting is so easy to handle, it was logical to use it for completely covering a wooden framework to make a polythene greenhouse instead of the traditional glazed glasshouse. These houses have been tested in several parts of the country, and as



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with most new developments growing methods need to be changed slightly.

A simple wooden framework can be erected and the polythene sheet stapled to the wood on the outside; alternatively it can be held down with thin battens.

In a polythene house the following points are important:

1. The house should be large enough to contain a large volume of air. It is better to make the house high and narrow rather than low and wide.
2. Adequate provision should be made for ventilation, especially at the ends and the ridge; this gives better ventilation than at the eaves.
3. Shading will be needed in hot weather, as the temperature can rise as high as, if not higher than, that in a similar sized glasshouse.
4. It is likely that the plants will need less watering than in a glasshouse.

It is not known how long a polythene greenhouse will last, but the material will probably need replacing after 3 years, possibly after 2 years. The main advantages over a glazed house are ease of construction, cheaper timber and lighter members, little danger of breakage or damage from broken glass, and cheapness in construction. On the other hand the replacement of the polythene is a continuing cost and it is not yet known whether a polythene house is suitable for all types of plants.

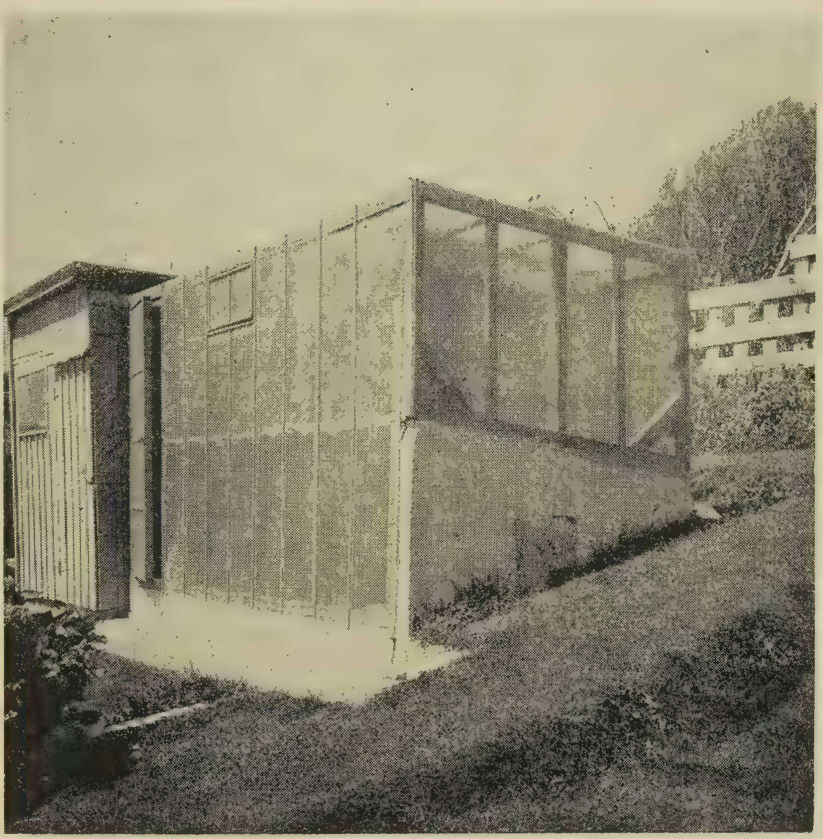
Polythene for Lining Glasshouses

Light gauge polythene has proved most useful for partially lining ordinary glazed glasshouses. It reduces temperature fluctuations by maintaining a higher temperature at night and protects the plants from draughts or cold winds.

The polythene is fixed to the cold or windy end of the house, along the walls, and part of the way up the rafters. The polythene should be fixed to the timber framework with drawing pins or by a stapling machine. Where staples are used a small piece of thin cardboard should be placed between the staple and the polythene to prevent the latter from tearing. The lengths of polythene are best run along the length of the house and fixed from the rafters downward, with an overlap of about an inch; the overlap being on the glass side so that moisture from condensation runs down to the sides and does not drip on to the plants.

A lined glasshouse would be specially suitable for propagation and the culture of orchids, begonias, ferns, and similar plants which require some shade and moisture in summer and an even temperature in winter.

A vertical division across a glasshouse could be made of polythene to provide two different atmospheric conditions in one glasshouse.



▲ A small glasshouse built of wire-embedded plastic and attached to a tool shed.

Plastics for Garden Frames

The wire embedded plastic can be used to make a light for a garden frame. The material is sold in a width of 36 in., and a frame 36 in. from front to back and 48 in. from side to side will be large enough for the average garden. Such a light can be easily lifted. Unless the light is hinged at the back, it should be held down by partly inserting galvanised nails into the front and back of the light and in the same position in the timber of the frame. These can then be tied together with soft pliable covered wire.

A small propagating frame for striking cuttings of plants can be similarly made, but the framelight should be covered with polythene. Cuttings should be watered with a fungicide such as captan (1 tablespoon to 2 gallons of water) to control fungous diseases. The frame should be inspected every week to remove dead leaves and weeds.

Separate wooden frameworks about 18 in. wide and 3 to 5 ft. long covered with polythene can be most useful in the garden. The polythene should be lapped round the timber and tacked on both sides of the wood or should be held by thin battens, as it tears easily if it is held only by a single row of nails. Polythene is sold in various gauges and the gauges of .003 in. (3/thousandths) to .005 in. (5/thousandths) are suitable for this purpose.

Frameworks of this type can be used flat like a framelight; two can be placed in an inverted V to form a tent cloche or three can be placed on the sides and top of a wooden framework to make a miniature greenhouse. It is necessary to leave a gap between the side frames and the top frame for ventilation; otherwise there is excessive moisture and condensation, which encourages disease and the plants themselves become too soft. Weeds will flourish under these frames, so regular weeding is required and any pests and diseases should be controlled as soon as seen.

A single framework of this size set on edge is also excellent as a windbreak around beds of newly set out plants or young seedlings. Special plantings of gladiolus, dahlias, or sweet pea seedlings protected on the windy side by such a framework will grow away well in the early stages, and by the time they have grown above the protection they will be strong enough to withstand the weather.

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Plastic Cloches

There are various plastic cloches on the market and in general they will prove to be as suitable as glass cloches, though the atmospheric humidity beneath them may be higher. Despite this it may be necessary to water the plants beneath them, if they are covered for a long period. Routine weeding and pest and disease control should be carried out; plants must be examined regularly, even if they appear to be growing well.

A most useful, cheap, semi-circular cloche can be made from polythene (see illustration on this page). Two-inch mesh wire netting is tacked on to a wooden batten on either side and a sheet of polythene stretched over the netting; this is also held down by battens. The polythene projects at both ends so that it can be folded down to cover the ends, making each cloche an individual unit, or it can be folded back so that a continuous run of cloches can be laid down.

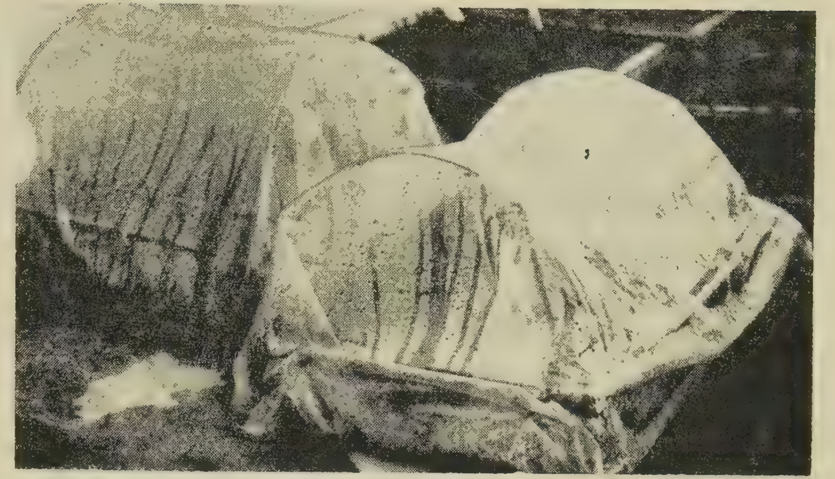
When not in use plastic framelights and cloches should be stacked away to prevent deterioration in sunlight.

Plastics for Striking Cuttings

Many gardeners propagate only a few plants or cuttings at any one time. They may not wish to use a frame and probably do not have a greenhouse available. Polythene can be most useful for this purpose. Where only a few cuttings need to be struck a flower pot can be filled with coarse sandy soil and the cuttings prepared and inserted round the edge of the pot. This is then watered and allowed to drain and the pot completely enclosed in a plastic bag, which is closed at the top with a rubber band and placed in a bright but not sunny place. Care should be taken that the leaves of the cuttings do not touch the plastic. Little attention is needed except to remove dead leaves; it is unlikely that the pot will need watering.

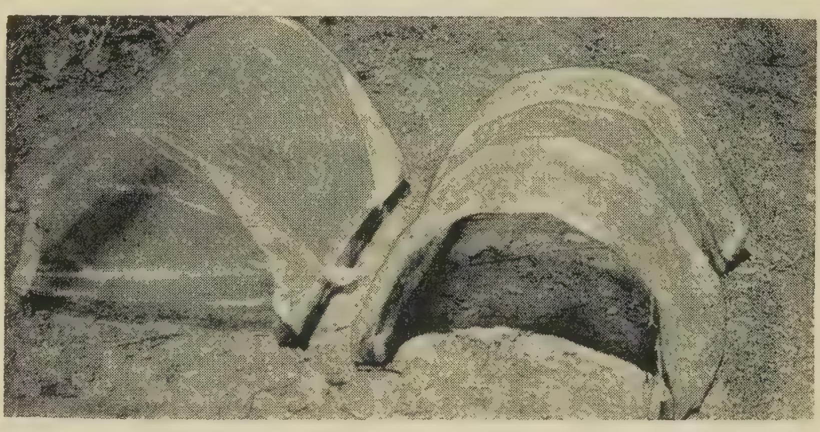
The top buds may start growing before roots are made, but when rooting has started leaf growth will be vigorous. At this stage the bag should be gradually opened at the top until it can be removed completely. If the cuttings are repotted and not planted in the open ground, the pots should be placed in open bags until the plants are established.

Where a quantity of cuttings are to be struck, the same technique can be used with a small seed box (see illustration on this page). Curved wires are placed at both ends of the box and across the middle, forming an arch. The cuttings are inserted in the rooting medium and a sheet of polythene stretched over the wires with the sides and ends folded under the box. As the cuttings root the plastic should be released slightly so that the plants can become accustomed to the normal atmosphere.



▲ A method of striking small cuttings. The cuttings are inserted in sandy soil in a seed box, two wires are arched over the box, and polythene sheet is stretched over it. These are then placed in a bright but not sunny place.

▼ Semi-circular plastic cloches. Polythene sheet is stretched over wire netting and held by battens. The polythene projects over the ends and may be pinned down to form a single cloche (left) or folded back when a row of cloches is required (right).



Protecting Plants

In windy positions newly set out shrubs normally need some protection until they are well established. Formerly scrim or sacking was used for this purpose, but it is unsightly, especially when it starts to fray.

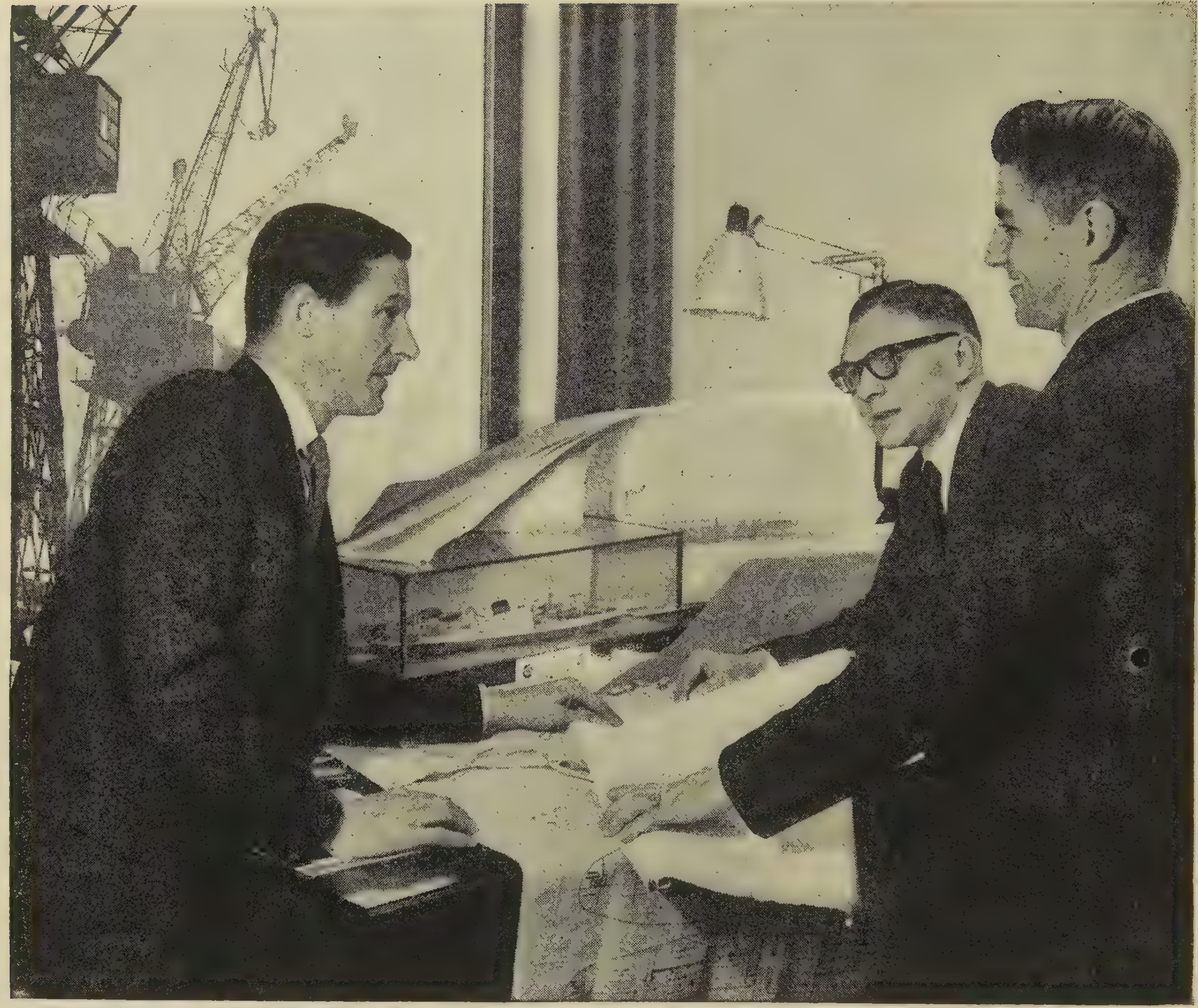
Polythene tubing or bags are excellent for this purpose. The material is easy to use and is not unattractive, and also acts as a complete windbreak. It is only necessary to insert 3 or 4 stout pieces of wood around a plant and to slip the tubing, or a bag opened at both ends, over the stakes. It can be kept in position with drawing pins, which are easily removed when the protection is no longer needed.

Carrying and Packing Plant Material

Gardeners frequently give cuttings or plants to visitors and it is often difficult to keep these in good condition until they can be planted again. Plastic bags are most useful for this. The method of packing varies with the type of material; it is unnecessary to place any surplus water or moisture in the bag, as the normal moisture given off by the plant in transpiration will maintain a humid condition in the bag.

Packing Cuttings

Leafy soft-wood cuttings of shrubs should be trimmed neatly at the base, the flowers removed, and the cuttings placed in a bag which is tied at the top. A fair amount of air should be left in the bag so that the cuttings lie loosely and do not press against the sides of the bag; otherwise the plant material will heat up and spoil. Where a large quantity of this material is to be carried in one bag some of the



Very long range planning

No matter how many ships New Zealand relies on *now* she will need even more in the future.

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In 1939 New Zealand Overseas Shipping Lines operated 127 vessels. Of these, no fewer than 69 were lost during the war—and only 15 were built. But, since the war 86 ships have been added to the fleets, 10 are in course of construction at this moment and berths have been booked in the shipyards for a further 11.

Progress is substantial, *but* . . .

Shipbuilding is not only an expensive business; it is a lengthy business. The ships for which those 11 berths have been booked *cannot* be ready until 1961. Even in their initial planning, shipowners must look ahead, certainly for three years and very often for five. These ships moreover, will continue in service until the 1980's and they must in consequence be able to handle a trading situation which lies so far in the future that no-one can clearly foresee its requirements.

In their *complete* planning, therefore, shipowners must look, not three years, but very nearly *thirty* years ahead. And that is very long range planning indeed!

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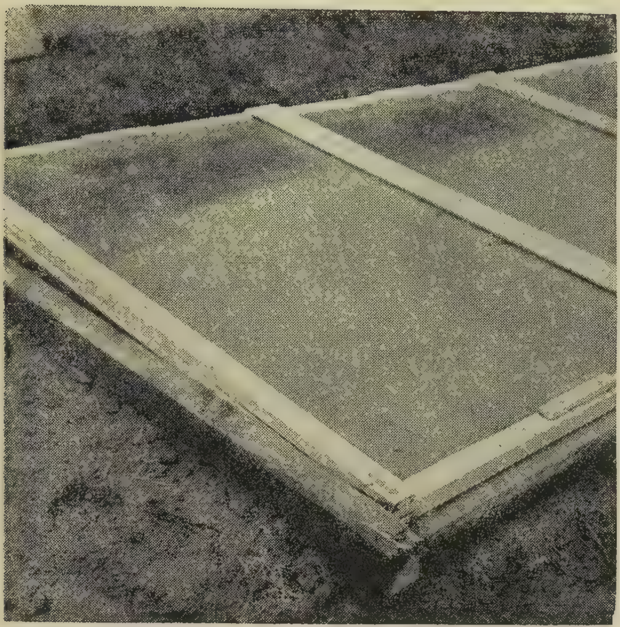
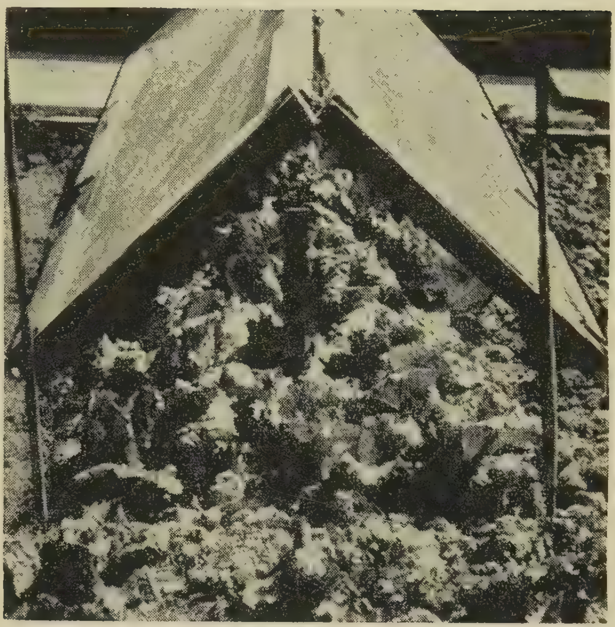


▲ A Dutch framelight. A single sheet of glass in a wooden framework, 2 ft. 11 in. x 5 ft. 2 in.



▲ Polythene-covered framelights used as a tent cloche.

leaves should be removed. The bag should be kept in a cool, shady place.

Packing Plants

Cuttings or budsticks of roses and other thorny plants can be placed in bags, but the thorns should be removed before packing.

Hard-wood cuttings without leaves may be wrapped quite tightly in a sheet of plastic; if they are to travel for some days, a small piece of slightly moist, not wet, sphagnum moss may be tied round the base of the cuttings.

Small plants can also be completely enclosed in a bag and all soil should be washed off the roots; otherwise it will shake off during the journey and stick to the leaves.

Polythene bags or sheets can also be used for packing larger plants; it is not advisable to enclose the whole plant in polythene. It should be wrapped round the roots or the ball of soil surrounding the roots. Provided this is moist at the time of packing and the polythene is tied firmly round the base of the stem, the plant will remain in good condition for several days. With bare rooted plants it may be necessary to work in a little moist sphagnum moss or damp hay round the roots. At planting time the polythene should be completely removed.

When small plants or leafy materials are sent by post in polythene bags it is important that the bags should be blown up so that the polythene does not press on the leaves; if this occurs the plants are likely to heat up and spoil. The external packing could be either a firm cardboard box or corrugated cardboard, finally surrounded with brown paper.

Plastic Pots

Traditionally the gardener has used clay pots. These are sometimes scarce, break easily, and often become covered in green algae or encrusted salts. Especially with the great increase in potted plants in the home, it has been necessary to find more attractive and durable containers.

Certain plastics fulfil these purposes very adequately and some types of plastic pot are competitive in price with clay pots and are coming into use in plant nurseries. In theory the clay pots should be more suitable for plants, as they are porous, but in practice this has not proved true. In fact in an experiment carried out by the Plant Diseases Division, Department of Scientific and Industrial Research, in 1950/51 it was found that impervious plastic pots had several advantages over clay pots, as the plants required less water, produced a greater weight of stem and leaves, and the roots were more evenly distributed in the soil. The pots also remained free of moss and algal growth and were easier to clean.

When plants are grown in plastic pots it is important to ensure that the pots have adequate drainage and the soil is open in texture. The plants will also require less water than if grown in clay pots. Unless the bases of the pots are ridged, the drainage holes must be kept open. The pots should be set on a thin layer of gravel and not placed directly on a saucer or tray.

Plastic Tools

Plastic articles are widely used in the house and similar equipment is suitable for the garden. Plastic buckets are excellent for carrying water or for mixing sprays, as they are light and normally not affected by the various chemicals. They are certainly preferable to galvanised buckets or kerosene tins, which should not be used for mixing sprays such as bordeaux mixture.

Plastic hose has replaced rubber hose to a great extent, as it is light, easy to join, and apparently very long-lasting; in cold weather it may be rather stiff, but in normal summer weather it is quite pliable.

It is also suitable for water reticulation, as it can be safely buried in the ground, and when laying out a new garden or remodelling an old one it could be worth while burying a hose the length of the garden so that one end is attached to an outside tap on the house and the far end used for a short hose with a sprinkler or tap. The perforated plastic hoses are also very

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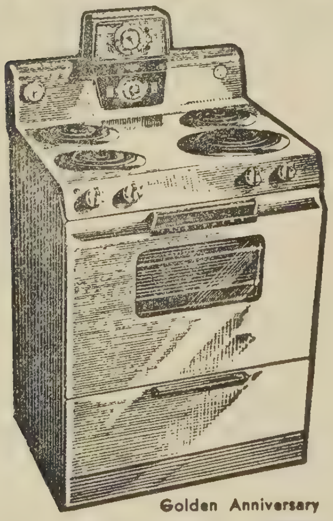

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useful, as they can be laid round plants or across beds and so apply the water exactly where it is required.

Some nurseries are now using strips of plastic in place of raffia for tying in buds of roses. As this is flexible and slightly elastic, it is easy and convenient to use and normally does not need cutting when the bud union takes place.

Polythene tubes are also used when aerial layering is being done.

Apart from the normal transparent plastic, black polythene sheet is also available. This has been recommended as a mulch round plants, and if used for this purpose, it should be perforated in several places so that water can enter the soil; in windy places it may be necessary to hold it down with small heaps of soil or stones.

At Canterbury Agricultural College, Lincoln, a small irrigation pond has been made by excavating the soil and lining the depression with black polythene sheet; the overlaps are sealed with a special adhesive provided by the supplier. In a small garden this same system could be used for a shallow paddling pool for children. This would be cheaper and easier to make than a concrete pool and the lining could be removed in winter so that the water could drain away naturally into a porous subsoil or a small sump.

Storing Materials

Plastic bags are excellent for storing small quantities of potting soil. Gardeners usually do not wish to mix a fresh batch of soil each time they are filling pots or boxes. Properly sterilised soil can be prepared in sufficient quantities in winter, brought to the correct moisture level, and stored in tightly closed plastic bags. It will then be ready for immediate use during the busy propagating season.

In the same way small quantities of fertilisers can be placed in plastic bags as soon as purchased, or fertiliser mixtures can be made up in wet weather ready for use. Storage in plastic is better than leaving the fertilisers in paper bags which disintegrate or tins which tend to corrode. The fertiliser can be identified by writing the name in indelible pencil on a tie-on label and fixing this round the mouth of the bag.

Garden Work for October

Seed sowing and setting out of bedding plants should be given priority among the tasks for October if a bright summer display is to be assured.

Euphorbia marginata, an attractive annual, seed of which can be sown in October.

Seed Sowing

Seed of a wide range of annuals can be planted outside during October. An interesting effect can be produced by sowing the seed of flowers of two contrasting colours in all the available pockets in a herbaceous border, a theme thus being made throughout the border. Red linum and mauve candytuft are a very effective combination which harmonises with most perennial plants.

The soil should be worked to a fine tilth incorporating ½ oz. of lime and 1 oz. of superphosphate per square yard. The seed should be sown thinly and lightly covered with fine soil. The seedbed should be lightly firmed to ensure that the seed is in contact with the warm, moist soil. When too much pressure is used the air may be excluded and the young seedlings will then have difficulty in emerging through the crusty surface.

Two Interesting Annuals

Two newer annuals which grow well in New Zealand gardens are *Molucella laevis* and *Euphorbia marginata*. Seed of these plants can be sown in the open ground at the end of October. *Molucella laevis*, commonly known as bells of Ireland, molucca balm, and shell flower, is a branched annual. If the plant is allowed to grow naturally, the branches form interesting angles and when covered with green calyces are useful for flower arrangements. When the leaves are removed the branches may be dried for later use in decorative work.

Euphorbia marginata is a branched hardy annual up to 2 ft. high, which

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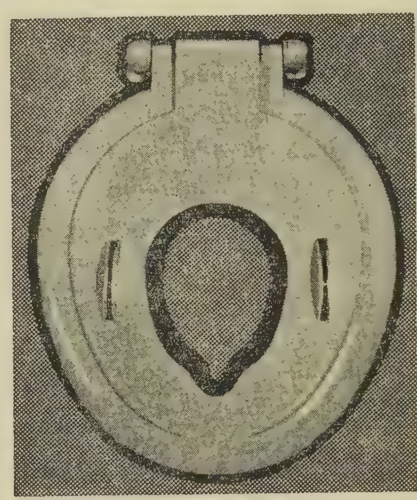

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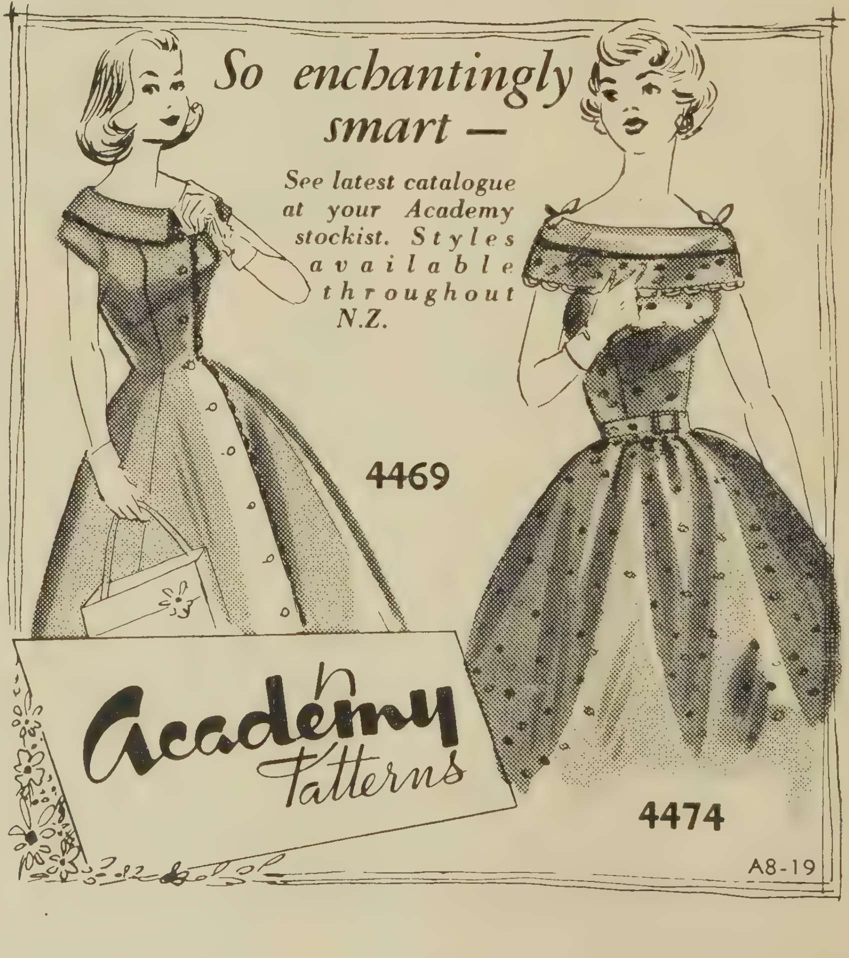

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needs to be staked. The whitish bracts last well as cut flowers, if the ends of the branches are first seared with a match or in boiling water.

Bedding Plants

It is generally unwise to buy bunched plants for setting out in the flower beds, unless there is ample soil around the roots and unless they have been carefully handled. Plants lose their freshness after having been bunched for 2 to 3 days and the lack of air may induce the action of soft-rotting fungi among the leaves. Plants grown in boxes usually are better nourished and sturdier. They can be planted out with the soil adhering to the roots and thus receive little set-back in growth. The boxes should be well watered on the day before planting, and if the garden soil is dry, the beds should be watered when the plants are set out.

Handling Boxes of Plants

For many people the weight of boxes of plants may cause strain on the muscles of stomach and arms unless the boxes are carried correctly. The box should be held with arms extended and the weight resting on the thighs. If the box is raised to a higher level as is often done, unnecessary strain is placed on the muscles.

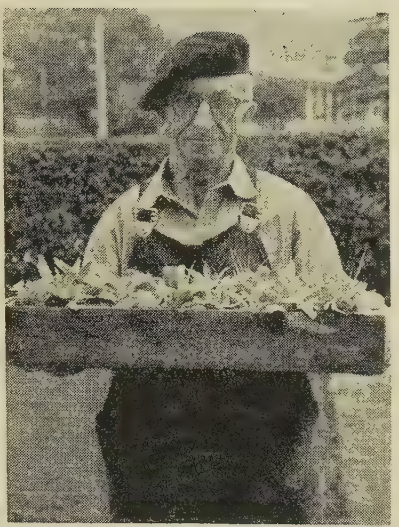
Before the first plants are taken from a box the box should be stood on its end and given a short, sharp tap against the ground. This will loosen the roots from the bottom of the box and the gap made at the top of the box will facilitate the removal of the first plants.

Planting Dahlias

Clumps of dahlias which have sprouted can be dissected now with a sharp knife and planted out in frost-free areas. Tubers with one strong shoot will give a good display during summer. Dahlias demand good nourishment and the soil should be prepared before planting by digging in compost or animal manure. A surface dressing of a general fertiliser mixture can be broadcast round the plant when it is in position.

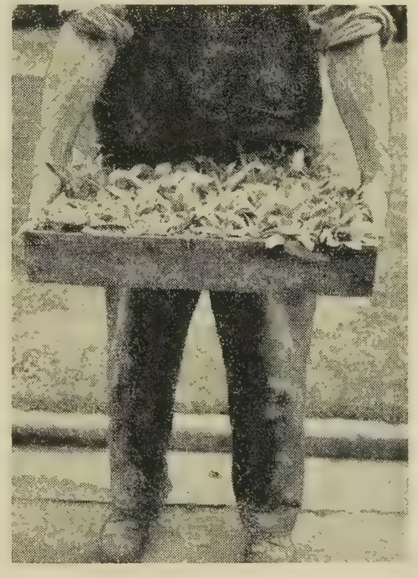
When planting positions have been decided and these are generally 3 ft. apart for giant decorative or cactus show types, suitable stakes should be driven in behind them. If plants of mixed heights are being planted and the heights are known, a uniform type of stake, but of varying heights, should be used. In more formal plantings every effort should be made to see that the stakes are evenly spaced and uniform.

The tuber should be planted so that the base of the shoot is below ground level to ensure stem rooting. Seedling dahlias can be planted 18 in. apart and slightly below the level at which they have been growing in the boxes.



▲ Incorrect way to carry a box of seedling plants. Strain and stress are laid on the muscles of arms and stomach.

▼ Correct way to carry a box of seedlings. The arms are extended and the weight rests on the thighs.



Iris innominata

It is not necessary to lift and divide *Iris innominata* more frequently than every 3 to 4 years, but when old plants are divided, either now or in autumn, a little extra care should be taken. The soil should be well cultivated to receive these plants, but should not be enriched with animal manure or lime. On very poor soil a little compost should be well worked in. The young white roots are easily damaged, and the root area should be moist before lifting so that the soil clings to the roots. A sunny well drained position is ideal for this iris, but it will flower reasonably well in partial shade.

Gerberas

Gerberas can be transplanted now into well drained sunny positions. The soil fungus phytophthora often attacks this plant and to some extent this can be overcome by providing adequate drainage in a raised bed. If soil fungus has caused the death of plants in the surrounding area, the bed should be soaked before planting with copper oxychloride as mentioned last month or with a solution of formalin, ½ pint in 3 gallons of water being used per square yard. The ground should then be covered with sacks for 2 days and after 2 weeks, forking and planting can be carried out. The addition of sand to heavy soils will improve conditions for gerberas.

Pruning and Care of Shrubs

When spring growth is starting is a satisfactory time for the shaping of evergreen shrubs and of the flowering prunus trees. With the latter especially, all pruning cuts larger than 1 in. should be sealed with petroleum jelly to prevent the entry of diseases, especially the silver leaf fungus. If trees have been cut down after attack by this fungus, it is necessary to dig out and burn the stump or it may produce the spores which infect other plants. As the new growth comes away plants should be inspected and if the growth is silvery, it is likely that it has been attacked by the blight. Infected branches should be removed well below the lowest visible sign of the disease and burnt.

This fungus disease should not be confused with the silvering effect which thrips have on many plants, including rhododendrons, lauristinus, and fuchsias. New growth from plants affected by thrips will be a normal green, while that from plants affected by silver leaf will be a dull silver colour. Plants which harbour thrips should be sprayed with DDT or lindane emulsions.

Deciduous shrubs such as forsythia, spiraea, and deutzia can be thinned out after flowering, if the bush has become old and tangled. The removal of old flowering wood will induce the growth of new shoots for future flowering.

Leaf Curl on Ornamental Prunus

Ornamental prunus is subject to attacks by the leaf curl fungus. This causes a distortion of the leaves and if

Old clumps of *Iris innominata* can be carefully divided early in October.

severe may cause premature dropping of the leaves. To prevent this trouble sprays of bordeaux mixture should be applied when the buds begin to swell. Under cold conditions or where infection was severe last year a second spray should be applied a week later.

Aphids

There are a host of types of aphids attacking a wide range of ornamental plants, causing distortion and stunting, especially of the young growths. Some aphids spread virus diseases among plants. Some of the ornamental plants most commonly attacked by aphids are roses, peaches, plums, and chrysanthemums.

Spraying with lindane, malathion, or a combination of nicotine sulphate and soft soap when infestation is apparent should give adequate control.

Lawns

In the spring weeds often dominate lawns which require fertilisers. To remedy this the weeds should be sprayed with hormone weedkillers before the lawn is topdressed with the regular 3-monthly dressing, at 1 oz. per square yard, of a mixture of 3 parts of sulphate of ammonia and 1 part of DDT superphosphate. A mixture of 2 fl. oz. of 2,4,5-T and 1 fl. oz. of MCP mixed with water and distributed over 100 sq. yds. will kill most weeds, including the common Onehunga weed, which has carrot-like leaves and sharp spiny seed.

Grass-grub Control

Though grass-grub control is simple, areas of lawn and many garden plants are killed each year by grass-grubs eating the roots. Attacked plants wilt and may die during the summer. The brown beetles will be laying their eggs now and in 4 to 6 weeks the young grubs will be beginning to feed. Lawns and gardens can be proofed now for about 3 years by applying DDT at 1 oz. of 50 per cent DDT to 40 square yards. This can be mixed with fertilisers for ease of distribution. Annual dressings of DDT superphosphate recommended above will give control also.

The brown beetle eats the foliage of a number of plants including prunus, roses, honeysuckle, and karaka and if the leaves of these or any other plants have been eaten by insects, ¾ oz. of 50 per cent DDT in 4 gallons of water should be used as a spray.

Glasshouse

Under glass seed sowing of tender annuals can be continued. The seedlings should be pricked off into boxes as soon as they can be handled and gradually hardened off. Many potting tasks should now be attended to; streptocarpus, gloxinias, aspidistras, cacti, heliotrope, and fuchsia can all be potted. If heliotrope and fuchsia have not been pruned into shape, this can be done after potting. Hydrangeas should continue to receive weekly applications of a weak liquid fertiliser to foster growth. Cyclamen which have finished blooming can be removed to a shady position.

General

Continue spraying roses with thiram, copper oxychloride, or captan for the prevention of black spot; use sulphur sprays to control mildew.

Gladiolus should be planted at fortnightly intervals to give a succession of blooms. The beds of young plants and the herbaceous border should be lightly forked to reduce weed growth.

Violets can be planted out now. Cuttings of chrysanthemums can still be taken and rooted in boxes of sand. The shoots of the young plants should be nipped back every 3 to 4 in. to induce a bushy plant.

Seed of rapidly growing annual climbers like *Mina lobata,* Argentine pea, and the snail flower can be sown where they are to flower. Supports should be provided.

Seed of polyanthus can be sown to provide young plants for flowering.

Trees and shrubs would benefit from a spring fertiliser dressing at 2 to 4 oz. per square yard of a mixture of 2 parts of superphosphate, 3 parts of blood and bone, and 1 part of sulphate of potash.

Plants should be examined periodically for pests and diseases and sprayed as necessary.

Cut Work

By PATRICIA M. BAWDEN,
formerly Home Science Instructor,
Department of Agriculture,
Palmerston North

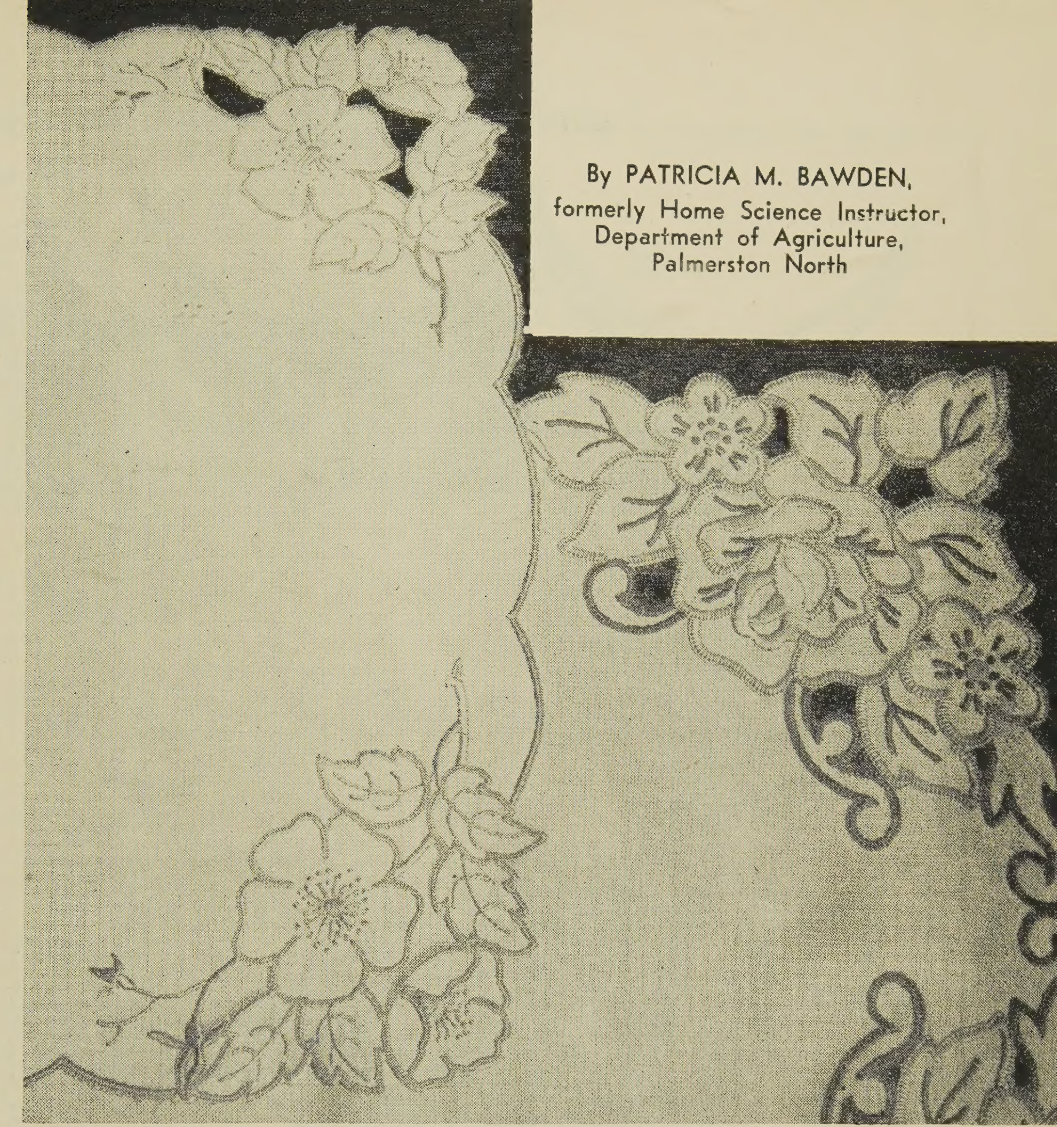


Fig. 1—Two embroidered mats. The stamens, stalks, and leaves are worked either before or after the background is cut out. Satin stitch, skin stitch, french knots, or any appropriate stitch may be used.

CUT work is a very attractive embroidery and may be quite simply worked, as the two stitches used are buttonhole stitch and running stitch. Cut work is therefore well within the scope of the most inexperienced needlewoman, but the finished effect depends largely on neatness.

THE designs used for cut work are mainly floral, but designs built up on curves and scrolls may be used with pleasing results. For instance, the mats illustrated in the heading photograph have cut-away scalloped borders and interest is added with simple drawn-thread work and satin stitch motifs. Stamped designs may be obtained, but original ideas may be quite easily worked out. However, care must be taken that every section of the embroidery overlaps and links up securely.

As the background is to be cut away, the spaces must not be too large. In renaissance embroidery, a more ornate form of cut work, bars are worked across these background spaces, care being taken that these are neither too long nor too great in number (Fig. 2). Where there is not a good balance between pattern and background any unattached portions may break away and the article become tattered after several washings.

Materials

Coarse linens are not really suitable, as they tend to fray out after cutting, causing a "furred" edge. Fine- or medium-textured fabric with a smooth finish is best.

Cut work is usually most effective when done in self-coloured thread. However, the simplest designs can be

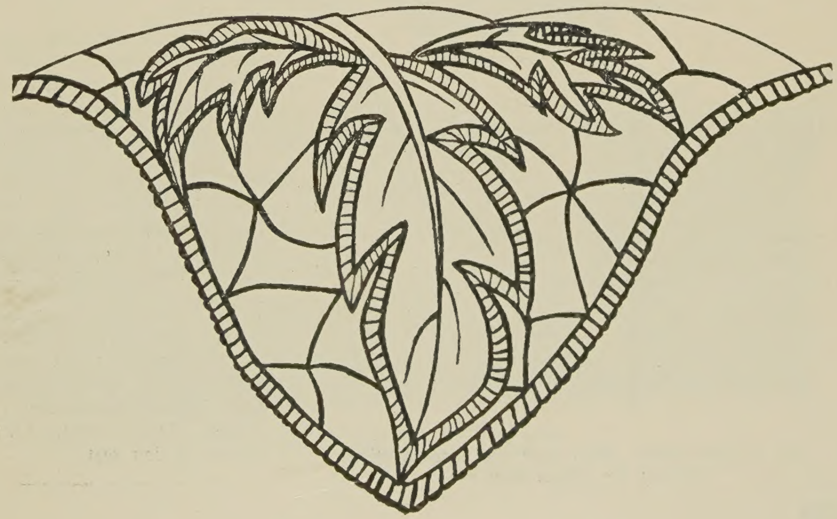


Fig. 2—An inferior design with → too much background removed. The parts surrounding the leaves have been cut away and fine bars of cotton looking like spider webs have been worked across the open spaces.

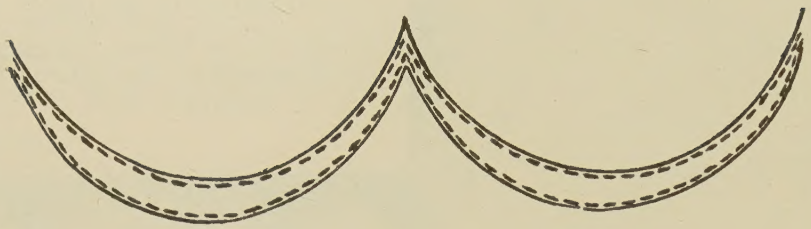


Fig. 3—Two rows of running stitch are worked between the double outlines.

most effective if sometimes worked in colours, but they should be restricted to one shade; for instance, white thread on a pastel background, or deep green or blue on white. If bold colours are chosen, care must be taken or much of the simple charm of the work may be lost. Most types of embroidery threads are suitable, but too thick a thread may make the work appear coarse and heavy. Linen threads and stranded cottons are most generally used with crewel needles of appropriate size. For cutting, small scissors with very sharp points will be required.

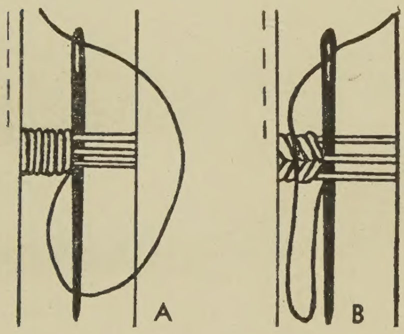


Fig. 4—A: Working a bar in buttonhole stitch. B: Weaving a bar. Bars are worked before cutting. Care must be taken not to catch the background material.

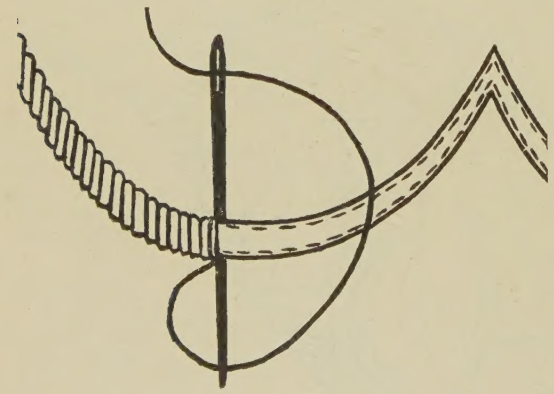


Fig. 5—Buttonhole stitch over the running stitch, keeping the edges very even.

Method of Work

Design patterns are traced out in double outline. These parallel lines regulate the width of the stitch to be used and also give a guide for a neat, even edge. If these lines are too close, the edging may not be firm enough and may possibly break away.

Begin by working a running stitch padding. Two parallel rows should be worked between the double outlines. This "lifts" the finished work and also helps to prevent fraying (Fig. 3). If there are bars in the work, these should be worked at the same time as the running stitch. Run the threads backward and forward several times, securing firmly at either end of the bar with small stitches. Then buttonhole stitch or weave across the bars, keeping them free from the background (Fig. 4).

Buttonhole stitching is now worked to cover the double outline. Stitch from left to right and take care that the loops of the buttonhole stitching are kept toward the edge to be cut away (Fig. 5). Do not pull the threads too tightly, especially at angles, or the work may pucker.

In some designs, as in the mats illustrated in Fig. 1, there may be stamens, stalks, or leaves that require filling in. These may be worked either before or after cutting with satin stitch, stem stitch, French knots, or any appropriate stitch.

Once the stitching is completed the background may be cut away. This must be done with the greatest care. First trim away the surrounding fabric and then the background to the design. Keep as close as possible to the looped edge without cutting the stitches.

Once the work is completed lay it right side down on a flat surface and dampen the fabric a little. Press well and leave to dry out.

Sugar Biscuits

THE following recipe is used as a base for many apparently different sugar biscuits. The addition of such flavourings as essences, caraway seeds, cocoa, dried fruits, nuts, and spices and the use of different methods of rolling and cutting the dough give considerable variations in the biscuits.

Basic Recipes

6 oz. of butter
6 oz. of sugar
2 eggs
12 oz. of sifted flour
1½ teaspoons of salt
2 teaspoons of baking powder

Cream the butter and sugar, adding the eggs one at a time. Beat the ingredients until they are light and foamy. (An electric beater is a great help at this stage.) Sift the dry ingredients together and add them carefully to the first mixture (turn the beater to slow speed). If flavourings are to be added, this is the stage when most of them are mixed into the dough, though spices and cocoa may be sifted with the flour and salt, etc., and sometimes nuts and crystallised fruits are pushed into the top of the biscuits when they are on the oven tray ready for baking.

If the dough is to be rolled, it is best to chill it first; if necessary, it may be wrapped in greaseproof paper and stored in a refrigerator for several days.

Rolling and Cutting Dough

1. Different methods of rolling and cutting the dough are:

1. Chill the dough, roll it on a slightly floured board to ¼ in. thickness, and cut it with sharp biscuit cutters.

2. Roll teaspoons of dough into balls, roll the balls lightly in sugar, and place them on a cold oven tray. Dip the bottom of a glass in the sugar and lightly flatten the balls. An almond, half a walnut, a glace cherry, or some crystallised ginger or angelica may be pressed into each biscuit.

3. Roll the dough into a cylinder of about 2 in. diameter, wrap it carefully in greaseproof paper, and chill it until it is firm. Place the roll of dough on a lightly floured board and with a sharp knife cut off thin biscuits (they may need to be patted into circles if the dough is not very firm). Sprinkle each biscuit with sugar.

Animal biscuits are made by rolling the dough thinly and cutting biscuits with animal-shaped cutters. Iced in fairly bright colours these are usually a great success at a children's party.

Thin biscuits should be cooked at 350 degrees F. for 10 to 15 minutes, and thick biscuits at the same temperature for about 20 minutes.

—*BETTY M. JOHNSTON,*
Home Science Instructor,
Department of Agriculture,
Wellington

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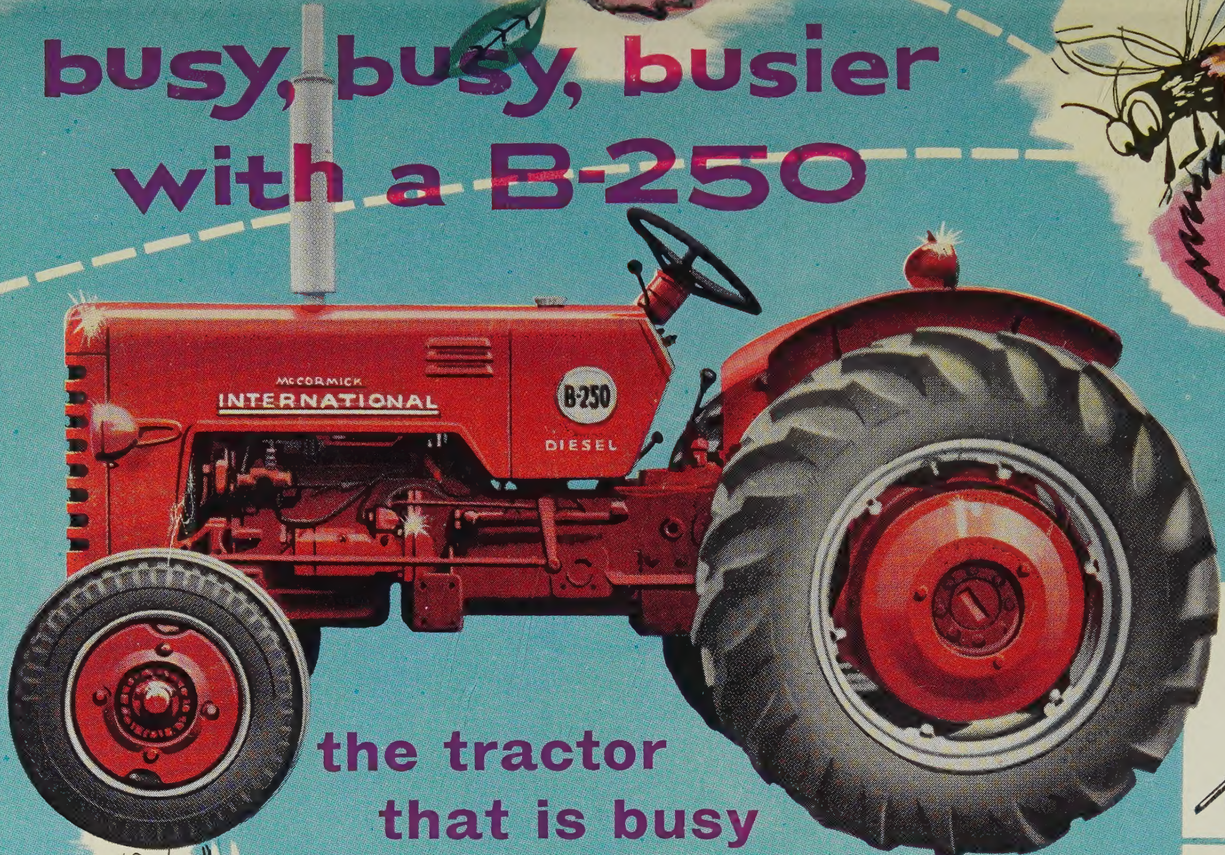

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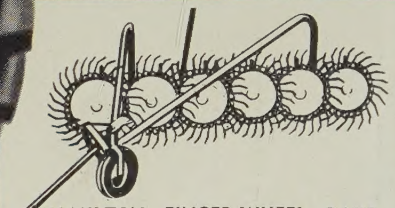

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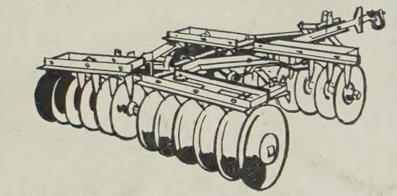

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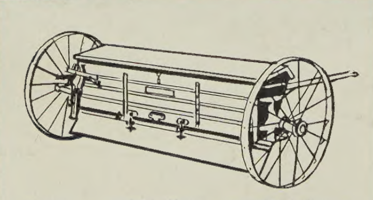

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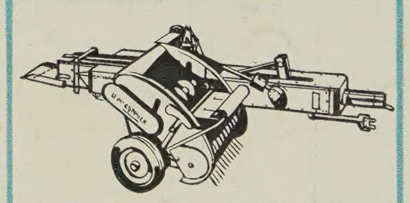

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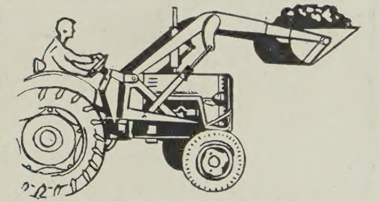

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